

THE IRON AGE

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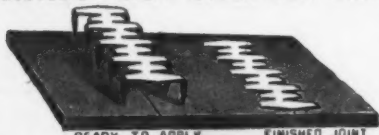
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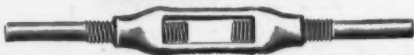
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THE IRON AGE

New York, Thursday, October 14, 1909.

A GREAT ADIRONDACK IRON ORE DEPOSIT.

The Largest Known Deposit Outside of the Great Lake Ranges.—Its Interesting History as Shown by Old Records.—Now Being Reopened by the MacIntyre Iron Company.

The largest known iron ore deposit outside of the Great Lake ranges, discovered as early as 1825 or 1826, exploited on a scale which was large for the time between 1843 and 1857, then abandoned for 50 years, is now being opened up on the head waters of the Hudson River, in northern New York, in the heart of the Adirondacks. Dominated by Mount Marcy, the highest peak, which the Indians called Tahawas, the princely realm of the old ironmasters has been the fishing and hunting preserve of a club bearing that name for 25 years. The 3000 acres of land cleared by the pioneers has nearly all relapsed into the wilderness, and of the "deserted village" which they built only the few structures survive which the club utilized for its purposes. The only operations which have been carried on for years consisted of the lumbering, confined to the soft woods, which could be floated to market.

The story of the struggles of the three men who, under the leadership of one of the most interesting of figures in the history of the American iron industry, conducted the early mining of this deposit, is one full of romance. There are preserved to us hundreds of letters between two of the three participants in the enterprise, Henderson, MacIntyre and McMartin. Those of David Henderson, the active partner, in particular are the intimate correspondence of a man of a keen, searching mind, capable of watching closely minor details and of taking the broadest views from a business point. A close observer, Henderson was an optimist, whom the second partner, and the one most heavily interested financially, found it necessary at some times to restrain and at others to encourage.

Historical.

The Tahawas ore deposits became known in 1825 or 1826, an Indian having called attention to a large outcrop, known as the Iron Dam, crossing the stream. David Henderson and A. W. MacIntyre, who appear to have been iron merchants at Newark, N. J., and some associates who had been operating at North Elba, one of the numerous iron forges of the Adirondacks, purchased large tracts of land from the State of New York, finally acquiring a total of close to 100,000 acres. They built 30 miles of roads into the wilderness and established a village at Tahawas, between lakes Henderson and Sandford, which ultimately included a bank, church, schoolhouse and dwellings. Close to the place now known as the Lower Works they dammed the river and established slack water between the Upper Works and Tahawas, thus securing water transportation for about 8 miles for the products of the plants. They floated these products down on large flat barges, one of which is still preserved, submerged in the brook which flows into Lake Sandford. From the Lower Works the iron bars and pig iron were hauled to market over the wood roads of that period.

It appears that the ores discovered in such abundance did not work kindly in the forge. In 1838 the first blast furnace was built, there being an animated controversy as to whether an 18 or 20 ft. high would be preferable. Later, forges and puddling furnaces were built at the Upper Works, and in 1850 a larger blast furnace 50 ft. in high was erected, the stack remaining practically

intact to-day. In 1848 the associates built crucible steel works at Jersey City, under the title of the Adirondack Iron & Steel Mfg. Company.

In 1845 David Henderson was accidentally killed by the discharge of his own pistol on the shore of one of the smaller lakes. The enterprise seems to have been carried on until 1857, when it collapsed. The great mines of the Port Henry District had been developed and had the advantage, being close to Lake Champlain, over the Adirondack Company of about \$25 per ton in freights on pig iron and bars. The long struggle, which, however, seems to have been brightened by at least one brief spell of prosperity was over. The records indicate that the associates sunk in all upward of \$600,000, an enormous amount of capital for those days.

The final act of abandonment seems to have been sudden. Years afterward occasional visitors reported that the last cast from the furnace was still in the sand, that the tools were left leaning against the walls of the cast house.

During the last 20 years the late James MacNaughton of Albany, one of the heirs of the estate, gave a good deal of thought and energy to the questions involved in the revival of the Tahawas iron industry and enlisted the co-operation of A. J. Rossi in investigating the technical conditions affecting the utilization of titaniferous ores. The results of that work are on record in the *Transactions* of the American Institute of Mining Engineers and in the columns of *The Iron Age*.

The Enterprise Under Modern Conditions.

Three years ago a controlling interest in the property, now embracing 66,896.8 acres, was acquired by Hon. Wallace Foote, Jr., of Port Henry, N. Y., and associates. It is to-day the largest single tract in the Adirondacks in private hands, and, stretching for 18 miles in one direction and 12 miles in the other direction, includes Mount Marcy and other great peaks in the heart of the Adirondacks. The whole tract is heavily timbered with both soft and hard woods, the latter never having been touched. The MacIntyre Iron Company, of which W. T. Foote, Jr., is president, and George C. Foote is general manager, has been steadily at work developing the property. The roads have been made passable, and a very large amount of exploration work on the ore deposits has been carried out. Arrangements have been consummated by which a railroad is to be built to Lake Champlain, a distance of 50 miles, so that with the completion of the barge canal, now being built by the State of New York, the ore can reach tidewater at low rates of freight. An offer has been made by an outside interest for 1,000,000 tons of ore annually, which is now under advisement. The company will in the meantime open up several of the other large deposits and prepare the ore for the open market. Thus, after a lapse of more than 50 years, these great resources are to be made available, modern practice in magnetic concentration and the dispelling of the fog of prejudice against titaniferous ores having cleared away the only obstacles. What this means may be judged from the fact that there are in sight, very conservatively estimated, through surface exposures, careful magnetic surveys of a part of the known ore bearing territory and, on the Sandford ore body, extensive dia-

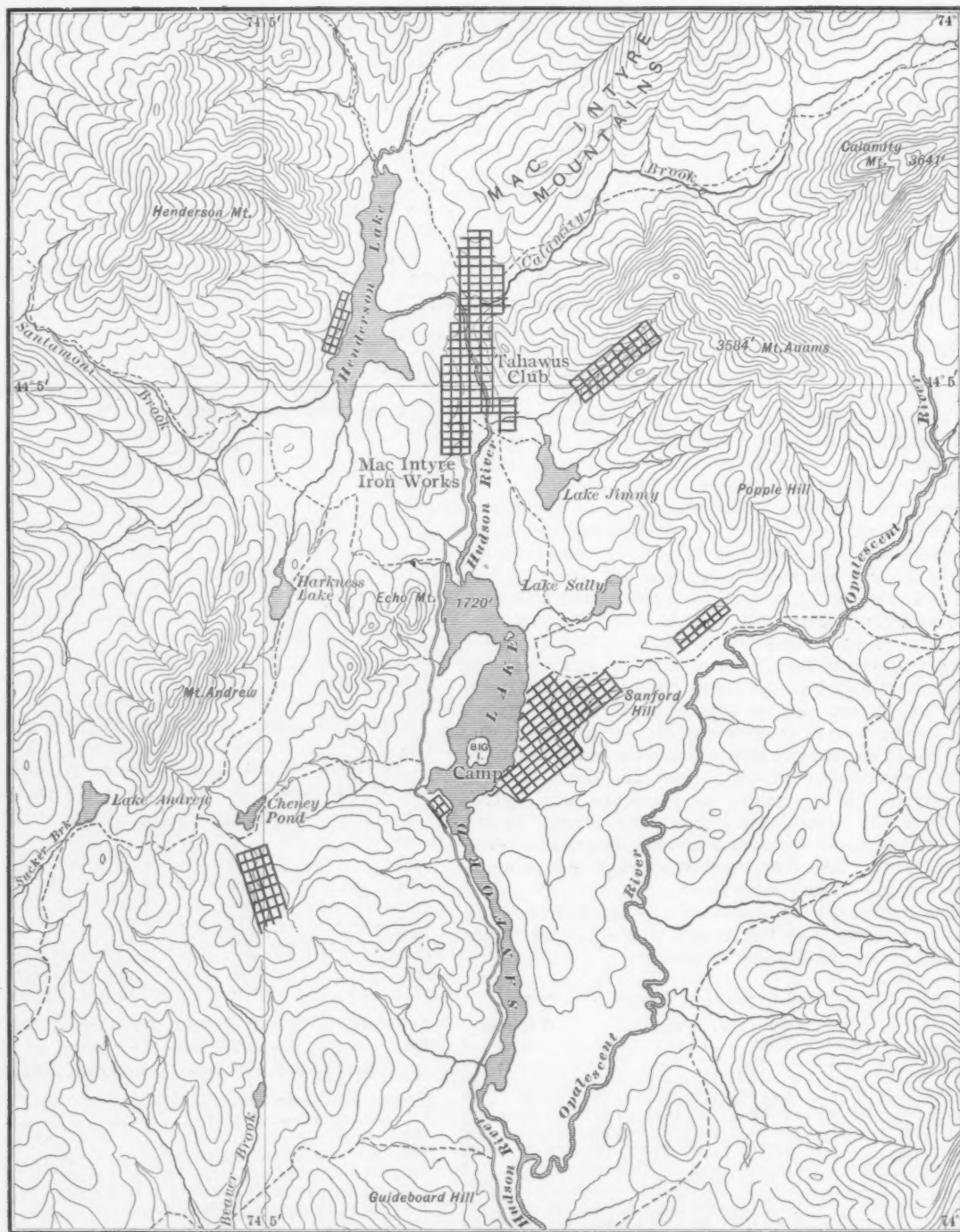


Fig. 1.—Map Showing the MacIntyre Ore Deposit so Far Explored. The Areas Plotted Have Been Studied by Magnetic Surveys or Diamond Drilling.

mond drilling, over 80,000,000 tons of crude titaniferous magnetite.

The question of quantity has, however, never been an issue. Ebenezer Emmons, in his "Geology of New York, Report of the Second District," published at Albany in 1842, made very thorough explorations by ditching and test pitting, at a time when much land was cleared which is now covered with forest. Other authorities have confirmed his conclusions, and the explorations made during the past few years have greatly extended the area, added probable reserves, and held out the promise of extensions of known ore bodies. To some extent the question of the grain of the constituent minerals is now one which may determine the selection of which bodies to work. While, generally speaking, the ore bodies vary little in their iron and titanium content, closer investigation may reveal some difference of value from a commercial point of view. Working tests have been made, both as to the results obtainable by magnetic concentration and as to the working of the concentrates in the furnace, so that the ground has been thoroughly cleared.

The Ore Deposits.

While there are strong indications of the existence of ore deposits at many points, and the actual existence of outcrops has been proved at many others, systematic exploration has been carried out chiefly on the groups of which Lake Sanford is the center. The accompanying map, Fig. 1, shows their location in a general way. It does not indicate their form, their extent or their relative importance, since the areas plotted show only the ground which has been studied by magnetic surveys, supplemented in the case of the Lake Sanford area by diamond drilling. In a general way the ground has been divided into these districts: Sanford, on the flank of Sanford Hill, east of the lake and rising 600 ft. above it; Mill Pond, on the slopes of both sides of the Hudson River, between lakes Sanford and Henderson; Calamity, on the east side of Lake Henderson, lying between the Hudson River as it flows to Lake Sanford and Calamity Brook; Jimmy Brook, on the flank of Mount Adams and Cheney Pond. Besides these four other districts are known.

The areas shown have been surveyed, there being

plotted the lines connecting the attractions from 10 degrees upward, by increments of 10 degrees. It must be remembered that nearly the whole ground is timbered and covered with an overburden of soil, which, however, is not deep. It is only on the flank of Sanford Hill that a part of the area has been cleared, as shown in Fig. 2. So far as earlier workings, recent trenching, test pitting and diamond drilling have revealed the character of the deposits, the Sanford body is clearly typical. The ore deposits seem to be large aggregations of magnetite, usually oval in shape, in which there are interspersed boulders and masses of the country rock. There do not appear to be any indications of vein or bedded forms, either so far as the ore itself or the included rock is concerned. There are only two openings on the Lake Sanford deposit, one on the flank of the hill, from which the pioneers took some ore, which is shown in Fig. 3, the figure of the man giving some measure of its size, and the opening along the road, Fig. 4, from which there is being mined some ore for a second furnace test, the first having been made two years ago by the Bethlehem Steel Company on a lot of 600 tons. Other views in the district are shown in Figs. 5 and 6.

Since the ore must be hauled over 35 to 50 miles of mountain roads, the delivery to distant furnaces is an expensive operation, so that very little actual mining has been done, operations being confined to exploration and to putting ore into sight. By test pitting, trenching and magnetic survey the Sanford ore body has been proved to be continuous over a length of 3000 ft. and a width rising to 1000 ft., with indications that it extends over a length of 6000 ft. In all 31 diamond drill holes have been driven over an area of 42 acres, the general plan being to sink at each station one hole vertically, one hole at an angle of about 40 degrees in the direction of the next group of holes, on one side, and a third in the direction of the group on the other side. These holes cover a longitudinal range of 2500 ft. In the case of some holes excellent ore is shown for practically entire depth. In others bodies of good ore alternate with lean ore or with barren rock.

The following table shows the records of these holes, with their depth, and the amount and character of the ore as to iron and titanium contents:

Records of Diamond Drill Holes, Sanford Hill District.

Number of hole.	Ore. Ft. In.	Rock. Ft. In.	Total depth. Ft. In.	Fe.	Ti.	Percentage of ore per hole.
4*	98 10	5 0	103 10	40.89	15.98	100
5*	148 11	29 1	178 0	44.35	15.96	83
6	30 8	127 0	157 8	46.21	13.39	19
7	150 4	111 4	261 8	45.39	16.21	57
8	283 11	164 5	448 4	47.10	16.12	63
9	99 8	113 0	212 8	44.90	10.52	47
10	72 0	199 2	271 2	.....	.....	27
11	326 6	102 6	429 0	51.90	13.06	76
12	65 9	34 0	99 9	50.65	13.67	66
13*	65 8	32 10	98 6	51.87	11.74	67
14	40 3	57 5	97 8	.....	.....	41
15*	82 11	15 8	98 7	48.97	13.84	84
16*	76 7	22 8	99 3	49.16	13.79	77
17	85 10	14 3	100 1	49.47	13.34	85
18	73 1	26 10	99 11	47.02	15.61	73
19	55 7	44 5	100 0	.....	.....	56
20	10 9	25 10	36 7	.....	.....	29
21	420 0	51 8	471 8	49.57	13.82	89
22	17 5	80 3	97 8	50.11	10.91	18
23*	354 11	16 6	371 5	46.30	10.88	95
24	143 7	175 6	319 1	40.88	13.43	45
25*	235 3	68 9	304 0	46.92	13.39	77
26*	125 3	74 8	199 11	38.00	11.53	63
27	166 4	128 8	295 0	46.01	12.72	56
28	46 7	215 3	261 10	41.99	11.58	18
29*	117 11	110 4	228 3	43.91	13.39	51
30*	175 4	12 8	188 0	48.62	13.80	93
31	75 5	119 8	195 1	43.84	10.45	39
32	4 6	154 4	158 10	40.15	13.98	3
Total drilling to end of 1908. 3,856 6½ 2,657 3 6,513 9½ 59						

* Stopped in ore.

The deepest hole, No. 21, has been driven with the object of testing the ground in depth. The record given below shows the following alternations of ore and of rock. Down to a depth of 503 ft. 6 in., there were 438 ft.

6 in. of ore and 65 ft. of rock, the percentage of ore being 87 per cent.

Feet. Inches.		Feet. Inches.	
Ore	11 0	Ore	9 11
Rock	1 7	Rock	3 6
Ore	38 8	Ore	1 3
Rock	1 6	Rock	1 9
Ore	34 8	Ore	2 10
Rock	3 6	Rock	2 1
Ore	10 10	Ore	11 0
Rock	3 10	Rock	1 7
Ore	32 0	Ore	7 0
Rock	7 2	Rock	4 10
Ore	13 1	Ore	44 10
Rock	6 6	Rock	5 0
Ore	2 6	Ore	110 2
Rock	2 10	Rock	17 6
Ore	118 9		
Rock	1 10	503	6

The following is a record of the continuation of diamond drill hole No. 21, showing the amount of ore and rock up to the total depth, 919 ft. 6 in.:

Feet. Inches.		Feet. Inches.	
Ore	6 0	Ore	1 3
Rock	7 6	Rock	1 0
Ore	3 0	Ore	2 0
Rock	1 0	Rock	1 6
Ore	4 6	Ore	3 0
Rock	1 0	Rock	196 6
Ore	1 0	Ore	1 0
Rock	3 0	Rock	7 6
Ore	7 0	Ore	6 6
Rock	3 0	Rock	23 6
Ore	1 6	Ore	6 6
Rock	20 3	Rock	60 0
Ore	9 9		
Rock	58 3	416	0

The total amount of ore was 32 ft., and that of rock 384 ft.

Complete analyses were made of the ore from holes No. 23, 24, 25 and 26, which are tabulated below:

Complete Analyses of Ores.

	No. 23.	No. 24.	No. 25.	No. 26.
SiO ₂	5.61	3.02	3.00	7.15
TiO ₂	16.80	25.25	21.91	21.10
Al ₂ O ₃	2.05	1.80	1.10	3.69
Fe ₂ O ₄	66.17	65.22	66.60	62.96
MnO.....	0.39	0.21	0.20	0.21
CaO.....	1.05	0.98	0.67	0.52
MgO.....	1.81	2.33	2.30	1.20
Fe.....	47.95	47.26	48.26	45.26

George C. Foote, general manager of the MacIntyre Iron Company, summarizes the results of the drilling operations in a report dated September, 1908, as follows:

Number drill holes completed.....	26
Total depth drilled, feet.....	5,185
Total depth of good ore, feet.....	2,946
Total depth of lean ore found, feet.....	566
Percentage of good ore to total depth, per cent.....	55
Percentage of lean ore, per cent.....	11
Average depth drilled per hole, feet.....	199
Average depth of good ore, feet.....	109

Estimated Ore Reserves.

Classified by analyses the ore shown up by the drill holes is estimated by Mr. Foote as follows:

	Tons.	Per cent.
Ore below 40 per cent. iron.....	6,087,254	20.1
Ore from 40 to 45 per cent. iron.....	6,244,824	21.0
Ore from 45 to 50 per cent. iron.....	8,223,905	28.6
Ore above 50 per cent. iron.....	8,181,892	28.5
Total ore shown by drilling.....	28,737,875	98.2

The total area shown on the Sanford deposit inside the 20 per cent. dip line of the magnetic surveys is 1,845,000 sq. ft., a part only of which is included in the area covered by diamond drilling. In estimating, each drill hole was taken as showing the territory immediately around it and up to the territory of the nearest hole, and the calculations were made by Mr. Foote for the ore in each territory, in this manner reaching the total of 28,737,875 tons of ore as actually shown up by the diamond drilling.

Mr. Foote estimates the amount of ore available in the leading other districts, based upon the magnetic surveys, which thus far have covered only a part and in some instances only a small part, of the known ore territory as follows, assuming that the areas so far surveyed



Fig. 2.—View of Sanford Hill, Showing Timber Removed Over Part of the Ore Body.

in the other districts contain the same average ore as the Sanford, down to an average depth of 130 ft.:

	Tons.
Cheney Pond District.....	16,800,000
Mill Pond District.....	23,200,000
Calamity District.....	17,200,000
Iron Mountain District.....	2,400,000
Total.....	59,600,000
Sanford (diamond drilling).....	28,738,875

Thus a total of 88,000,000 tons of ore is estimated to be available, on the basis of areas which include only ground explored by magnetic survey, and included within the 20-degree dip line, and extensive diamond drilling to determine persistency in depth of what may be only one of the larger deposits. The test in depth has gone much beyond the average assumed for the balance of the Sanford body and seems safe for the areas whose surface only has been surveyed. In fact, since the above report was written an opening has been made from which 1250 tons of ore have been taken which shows 2 per cent. of rock only in this entire body of ore. It is also clearly shown that this rock occurs as boulders from a few inches to 2 ft. in diameter, but which would have shown in the drill cores as stratifications of rock from 2 in. to 2 ft. in depth, and on this basis the contents of the hill have been estimated. On the other and proper theory of the rock occurring as boulders, the amount of iron in Sanford Hill would be nearly doubled. It must be borne in mind that Mr. Foote has taken an average depth of 130 ft. only, when the drills have since shown the ore at depth of over 800 ft. The report of Professor Emmons of over 100,000,000 tons of ore in this body is clearly justified. The Port Henry deposits, similar in character, have been followed to a depth of 825 ft., and to-day, after over 12,000,000 tons have been extracted, have more ore in sight than they ever had.

Testing in depth has just been started in the Cheney deposit, one of the diamond drills having been transferred to that district.

The question of quantity may therefore be regarded as solved, so far as the future for many years is concerned, and so far as it involves the justification for the outlay of capital necessary to build the railroad, without which these enormous resources are practically valueless.

As to the fact that large quantities are available, there is the testimony of such experts and engineers like Ebenezer Emmons in the earlier times, and later of J. Uno Sebenius, now of the United States Steel Corporation, but then of Scranton & Sebenius, consulting engineers; Dr. Smock, for years State Geologist of New Jersey; Prof. James F. Kemp of Columbia University, and John Birkinbine of Philadelphia. It is, however, the question of quality which may give rise to serious doubts in the minds of ironmasters, who have retained the deep rooted prejudices against titanium in magnetites.

Cheap Mining.

Before taking up that crucial subject, we may briefly allude to the conditions which affect the cost of mining. For years to come the mining of the ore will consist of

simple quarrying under very favorable conditions. The overburden is limited to a comparatively slight cover of soil, and the topography of the Sanford District, notably, and of the others, is such that the bench system, with its tracks and spoil banks, can be readily developed. Studies relating to the lay out and to the creation of the village for the workmen have already begun. That the mining of crude ore can be done at very low figures is obvious, the experience of similar operations elsewhere being an adequate and safe guide.

The Quality of the Ore.

There remains then the question of quality, which involves carrying the crude ore to a higher grade in iron, which is regarded by important furnace interests as the paramount consideration and the elimination of as much titanium as possible since most furnace managers now, and probably will for some time, look askance upon the presence of titanium in the ore. The attitude of the Bethlehem Steel Company to the question of titanium contents is clearly defined, since in the first proposed contract with the MacIntyre Iron Company no limit whatever was placed on the titanium content, the sliding scale dealing exclusively with the iron in the ore.

The ore is a mixture of the titanium mineral, ilmenite and of true magnetite, in which the Fe_2O_3 has been partially displaced by TiO_2 . In other words, the titanium seems to be both mechanically and chemically associated with the magnetite. The limits of possible elimination of the titanium are therefore set by the quantity of that element which in current practice can be separated out of the ore as ilmenite, and the enrichment of the ore in iron is also therefore dependent upon the conditions imposed thereby.

To a considerable extent, the success of mechanical separation of the ilmenite from the magnetite depends upon the size of the crystals. If they are small and closely interwoven, costs for crushing down to the size which permits of adequate separation rise rapidly, and the concentrated furnace product is in the form of fines which either cause embarrassment to the furnace manager, or, to relieve him, call for a briquetting or nodulizing operation, which reduces profits.

Magnetic Separation.

Tests on a manufacturing scale alone can solve such questions and these have been carried out, although under adverse conditions, at the Port Henry magnetic concentrator of Witherbee, Sherman & Co., where the dressing of magnetites has been carried to the greatest perfection after long and very costly development.

Under the direction of S. Norton of Witherbee, Sherman & Co., well known as a leading expert, a run was made at Mineville in December, 1906, in No. 2 mill. The ore selected was Sanford, of which 23 tons, containing about 51 per cent. of iron and 13 per cent. of titanium, was used. There was recovered 18 tons of heads containing 60.28 per cent. of iron, 6.08 per cent. of titanium, and 0.009 per cent. of phosphorus. The tailing carried



Fig. 3.—The Old Opening on the Sanford Hill Deposit.



Fig. 4.—The New Opening on the Sanford Hill Deposit.

31.12 per cent. of iron, 25.39 per cent. of titanium (ilmenite containing 33 to 35 per cent.) and 0.012 phosphorus. Mr. Norton states that the test was carried out under adverse circumstances, for attaining fine work, since it was done at night. The ore was crushed to pass through a 30 mesh, and was run over a simple belt magnetic separator, only one pass being made. Mr. Norton estimates that it requires 1.33 tons of crude ore to produce 1 ton of concentrates.

George C. Foote, in the winter of 1908-1909, made a series of tests in a small model separator at Mineville. Passing the material through a $\frac{1}{4}$ -in. mesh screen, the average of eight separations gave:

	Per cent. iron.	Per cent. titanium.
Crude ore.....	50.74	12.76
Concentrates	58.82	6.60
Tailings	36.95	23.43

The result of Mr. Foote's tests show that a 50 to 52 per cent. ore crushed through a $\frac{3}{8}$ -in. mesh screen can be made to yield 58 per cent. of iron and 7 per cent. of titanium, with a loss in the tailings of 12.3 units of the crude ore introduced. On a 50 per cent ore it requires 1.57 tons of crude ore to produce 1 ton of concentrates, while, when the crude ore has an average of 52 per cent., it requires 1.40 tons. Since 1,309 tons of material in place produces 1 ton of crude ore, there will be required 2.05 tons of material in the deposit to yield 1 ton of shipping concentrates. The cost of crushing and cobbing is placed at a shade over 30 cents per ton of concentrates. Such a cost, added to that of quarrying 2 tons of crude ore, under the exceptionally favorable conditions as to mining, yields a low cost, to which a royalty must be added. A haul of about 50 miles to Lake Champlain, on grades with the haul throughout, brings it within the reach of water transportation to tidewater, or to the lakes, and of rail transportation to the furnaces of eastern and central Pennsylvania. It is estimated that, on the completion of the State canal from Lake Champlain to the Hudson River, which is all under contract now and will be finished in two years, giving 11 ft. draft and a barge cargo of 1300 tons, the cost of water freight from Lake Champlain to New York harbor will be 40 cents per ton; adding a rail freight of 1 cent per ton per mile on 50 miles of railroad from mines to lake would make a total of 90 cents to New York harbor. This, plus cost of mining and concentration, plus a reasonable royalty, would make an ore price that would materially aid the Eastern pig iron producer in his competition with the West.

The Availability of Titaniferous Magnetites.

We have then available to the furnace manager crude ore, cobbed ore and concentrates carrying from 59 to 60 per cent. of iron and 6 to 7 per cent. of titanium. The question is whether such an ore can be used or marketed in adequate quantities, principally in the form of concentrates of one-quarter inch and under.

There is little doubt that a few years ago the great majority of furnace managers would promptly have condemned such an ore as a component part of their bur-

den in any proportion, however small. For many years furnacemen have shunned titanium like a pest, and a prejudice has grown up against it, which is well illustrated by the dictum of one of the most famous living furnace managers of this country, whose experience, however, has been almost entirely in the Central West, where magnetites are never used. He placed its availability in the furnace at one-half of 1 per cent. as a maximum and was greatly astonished to learn that there is not a furnace in operation on New Jersey magnetites which does not carry 0.75 per cent. of titanium in its burden.

It is possible that the fate which overtook the Adirondack Company, the pioneer in the working of the Tahawas ores, may have contributed originally to that prejudice. But there are a number of instances in which the troubles in the operation of a furnace working with titaniferous ores, when not properly fluxed, were traced to the presence of titanium, and led to prompt rejection of the guilty ores, although the extraordinary quality of the metal produced always attracted attention. Such a case occurred early in the eighties at the Secaucus Furnace in New Jersey, which was using an ore imported from Ireland, as part of a burden on Bessemer pig, the low phosphorus content, usually characteristic of titaniferous ores, being an attractive feature.

It was A. J. Rossi, who had long experimented with New Jersey magnetites, who first undertook a systematic study of the action of titaniferous ores in the furnace and dealt seriously with the problem of scientific fluxing. Mr. Rossi's work, however, was done at a time when those furnace managers to whom ores of this character would be naturally offered were not as keenly interested in possible sources of supply, since the concentration of Lake ores in a few hands had not gone as far as it has now, and they were not at the mercy of Lake ore interests, who at the same time were not then, as they now are, their chief competitors as producers of pig metal.

It is better understood now than it was then, and improvements in fuel consumption and in the utilization of fuel have gone apace in the mean time, so that, given ore at low prices, iron and steel can be made in the East as cheaply as at Pittsburgh, and local works have the clear profit of the handicap of freight to Eastern markets under which that famous producing center lies. The utilization of titaniferous ores, of which there are more than one large deposit in the Adirondack region, will contribute materially to that end.

Rossi's Early Experiments.

For several months in 1895 Mr. Rossi ran a small experimental blast furnace at Buffalo, whose capacity was 3 to 4 tons per day, working first with Lake Superior ores and then on mixtures in which the quantity of titaniferous ore was increased until the furnace was on the latter ore exclusively. The titaniferous ore contained from 15 to 16 per cent. of titanic acid, 0.017 phosphorus, 0.025 sulphur and 56 to 57 metallic iron. The slags ran perfectly fluid for a distance of 50 ft. from the furnace. They contained 35 per cent. of titanic acid,



Fig. 5.—View from Sanford Hill Looking North Up the Valley. Drill in the Foreground.

16 silica, 15 alumina, 20 lime, 10 magnesia and about 2 per cent. of oxides of iron and manganese. The pig iron contained traces of phosphorus, 0.045 per cent. of sulphur, 0.11 to 0.13 silicon, 1.85 carbon and 0.03 to 0.05 titanium. Mr. Rossi found that slags in which the oxygen ratio of the acid element, titanitic acid and silica, was to the oxygen of the bases as four to three were the most available as to fusibility and fluidity. They were crystalline.

At the time Rossi's work, while its scientific value was appreciated, fell upon deaf ears so far as practical results followed.

The Experience of Furnace Managers.

But titanium did not have for all furnace managers the terrors which it inspired with a few. A highly interesting experience is that of R. H. Lee, now furnace manager at Lebanon, Pa., of the Pennsylvania Steel Company, who some years ago found it necessary to use a large pile of titaniferous ores, which had been shipped to the Pueblo Works of the Colorado Fuel & Iron Company years before, and which had not been used, having caused trouble in the furnace when first brought there. The ore averaged 35 to 39 per cent. in iron and pretty regularly carried 12 per cent. of titanitic acid. Mr. Lee used this ore in various proportions from one-twelfth to over one-half of the furnace burden over a period of nearly three months. The ore was a magnetite and was used in place of a hematite; consequently the output was somewhat decreased and the fuel raised a little, but otherwise the work was perfectly regular and gave no more trouble than the hematite; in fact, there was not as much trouble, as there seemed to be less tendency to hang or stick.

The most deliberate and persistent work in this direction has been done by F. E. Bachman, general manager of the Northern Iron Company, Port Henry, N. Y., who summarizes his experience in the following:

In 1891 I used several hundred tons of magnetic ores containing 50 per cent. iron and 13.5 per cent. titanitic acid in the Salem Iron Company's furnace at Salem, Va. I knew nothing about fluxing titanitic acid at the time and did not make any attempt to flux it. The proportion of titaniferous ore in the mixture ranged from one-sixteenth to three-sixteenths of the total ore charged. The ore was charged pound for pound as against a brown hematite ore containing an average of 38 per cent. iron. The only results noted from its use were that the cinder produced ran as if it was decidedly too acid and looked when cold as if this assumption was incorrect, the fracture being rather basic. At the time the experiment was tried my chemist was one who could not make a titanitic acid determination under three weeks. No analyses of the cinder other than for the ordinary constituents were made. The iron while using the ore changed in grade, by fracture, from foundry to gray forge, the silicon remaining about the same as it was previous to the use of the magnetic ore. At the time the results obtained did not seem satisfactory, although the use of the ore had no deleterious effect on the furnace whatever, the output being increased corresponding with the increase of iron in the mixture. Later knowledge, of course, explains the acidity of the cinder and the cause of the lowering of the grade of iron produced. The principal peculiarity which we noted was that it was impossible to break the iron we made over the block which had been arranged for handling our pig iron, and it was further almost impossible to break a pig with a double handled 56-lb. sledge. In one case I remember sledging a pig until it had a set of 2 in. in the center before it broke.

In 1903 I had occasion to watch the operation of a charcoal furnace at Standish, N. Y., which subsequently came under my management, and was converted into a coke furnace. The ores used contained enough of titanium to produce a slag containing 2.75 to 3 per cent. of titanitic acid. The furnace was operated on charcoal for about 18 months, during which period none of the bad effects supposed to be produced by titanium appeared. When blown out there was no more salamander than would be expected and no more indications of nitrocyamide of titanium than are found under ordinary conditions. The same furnace is now operated on the same ores, using coke. The slag produced contains on an average 1.75 per cent. titanitic acid, which amount has no effect in producing what are known as "high bottoms." In fact, this furnace has given us continual trouble, owing to the bottom being abnormally deep. It is my opinion that it would be perfectly safe with our furnace to use sufficient titanium in an ore mixture to produce a slag containing 5 per cent. of titanitic acid, and probably more, with no deleterious results.

The observations which I have made of the remains of the old MacIntyre Iron Company's furnace, near Tahawas, N. Y., have almost convinced me that ore mixtures containing as much as 20 per cent. titanitic acid can be furnace, as the bosh of this furnace has every indication that it was never scaffolded, and the hearth is as free from salamander as any furnace I have ever seen, while the dump shows no indications of what we would call to-day "hard-luck furnacing," such as heavy runners, salamanders, black cinder and scrap. Unfortunately, there is no record of this furnace in existence, but we have every reason to believe that it was operated with fair success for one blast of at least 18 months previous to its being abandoned, owing, we believe, to its unfortunate geographical position with relation to transportation facilities.

The Bethlehem Steel Company, in 1907, made a special test of about 1500 tons of Tahawas ore, under the direction of Charles A. Buck.

A highly interesting corroboration of the fact that the use of titaniferous ores in the blast furnace does not necessarily mean endless stoppages through the accumulation of impossible masses is furnished by the condition of the old furnaces at Tahawas, pictures of which are shown in the accompanying illustrations, Fig. 7. To the modern furnaceman, who knows that the furnace carried a burden of highly titaniferous ores and concentrates, the condition of the interior of the furnace is its most interesting feature.

The furnace itself is 48 ft. high and was blown through three tuyeres, the stack being very substantially built. It had a hearth diameter of 4½ ft. and a very flat bosh, the diameter being 11½ ft. Two brick hot blast stoves, practically intact, are placed on top of the furnace, which was charged over a bridge connecting with the hillside, where there are still, overgrown with trees, large piles of charcoal and piles of ore from different properties whose source is readily recognizable to-day. The power was supplied by two large undershot wheels with wooden centers and iron gearing, driving two sets of horizontal blowing tubs, which are still in place in the pit. An examination of the lining discloses that it is thoroughly glazed to the top, but that it shows no local wear. From the records it appears that the furnace had a daily capacity of 14 tons of pig iron. An analysis of the slag shows:

Analysis of Old Furnace Slag.

	Per cent.		Per cent.
SiO ₂	34.54	MnO	0.54
TiO ₂	25.44	CaO	16.62
Al ₂ O ₃	10.45	MgO	4.52
FeO	6.94	Na ₂ O + K ₂ O	0.95

Water Power.

Surveys have been made which show that there can be developed, by the building of a dam on the Opalescent River, water power to the extent of 1100 hp. It calls for the building of a dam 175 ft. long and 30 ft. high, which will give a head of 375 ft.

Railroad Connections.

There has been organized the Champlain & Sanford Railroad to connect with the Delaware & Hudson Railroad, near Addison Junction, at the same time reaching Lake Champlain, with its water transportation to tide-water and the lakes. Another, a shorter line, has been surveyed via Schroon Lake to Riverside in the Adirondack Division of the Delaware & Hudson Railroad. The accompanying map, Fig. 8, shows the connections thus described.

THE PERPLEXITIES OF A PIONEER IRONMASTER.

The intimate correspondence of two of the pioneer associates, David Henderson and A. W. MacIntyre, ranges over the whole field of the enterprise, there being a curious mingling of gossip relating to the doings of those concerned in it, down to ordinary laborers, of records of trials and tests, and of views and theories relating to ironmaking. In the light of our present scientific and technical knowledge these are both curious and fascinating, and yet one cannot escape the feeling that much which is written to-day with so much confidence and conviction may 50 years hence provoke the same tolerant smile of the up to date metallurgist of 1960, mingled with

some admiration of his astuteness which to-day are too likely to greet the writings of David Henderson.

Nor did the old ironmasters neglect other possibilities. While still eager to buy wild lands in Essex County, David Henderson, in a letter to MacIntyre, writes under date of March 27, 1837, that Governor Marcy "has some idea of camping with us next time we visit the upper Hudson. The territory is getting so much notice that I verily believe were a railroad to be made from the lake and a large public house erected it would become a fashionable resort for the summer months—the notch being the greatest curiosity in the country next to the falls of Niagara. If Niagara be the prince of waterfalls the other exhibits the prince of precipices."

English Influences.

Early letters, too, indicate how largely our iron and steel makers depended upon their English brethren for expert knowledge. In 1840 specimens of iron ore and of bars were sent through E. F. Sanderson of New York to his brother at Sheffield to test the iron for steelmaking purposes and to make a trial of the Sheffield Sanderson's patent method of swelting the ore. So much depended upon this that in December, 1840, Henderson writes: "Unless something comes out of this Sanderson matter, I see nothing but Adirondack will have to be shut up for the present, and indeed in such event it is a pity that more provisions are sent up this year. I have foreseen, since it was found that we could not go on on a small scale ourselves, by blooming to pay expenses, that the establishment would be shut up (by shutting up I mean merely to have some person there to take care of the place) unless, indeed, some arrangement can be made in England as we have proposed." The later correspondence does not reveal what became of these trials nor give details concerning the methods involved.

The Employment of Convicts.

An interesting side light on another subject of contemporaneous interest crops up in the correspondence in the form of an effort to obtain relief in another direction. It appears that a man named Cook brought before the Legislature of New York the project to purchase the mines in Clinton County for a prison and the employment of convicts there. MacIntyre writes in 1843: "The owners of a granite quarry on the North River, in Putnam County I think, are pressing the Legislature to erect a prison on their ground and employ the prisoners in quarrying and dressing granite. Angry publications are appearing every day or two between the iron party and the granite party." Later Henderson agrees that it is much better that Cook did not recommend in his report for the State to take up Adirondack for the convicts, and adds: "A good deal has been already said in many newspapers abusing the iron project altogether—and most of those pieces shew a remarkable ignorance of the whole matter. One writer in the *Tribune* says that all the iron mines in the State of New York are not worth 70 cents—that bar iron can be made in Maryland at \$24 per ton, &c."

Discovering the Complex Character of the Ores.

It appears that some time in 1842, puzzled by the fact that the Adirondack ore did not work well in the forge, David Henderson discovered that it consisted of two minerals and reached the conclusion that they were two oxides of iron. He observed that they differed in color, and also that one was magnetic and the other not. It was only later that the presence of titanium was suspected, and even then the brighter, nonmagnetic oxide which he calls "peroxide" was not identified as ilmenite. The best presentation of his theory is given in the following letter to his partner, to whom he writes from Philadelphia, February 13, 1843. There are other interesting letters, from both, which show how MacIntyre at first failed to understand and brought out further elucidating correspondence:

I have just been conversing with Mr. Dobson on the subject of the black magnetic oxides, and the mechanical separation in distinct chrystals which compose them, as now ascertained. When this theory was first stated to him, some time ago, he would not admit it, and told Robertson a few

weeks ago that I was mistaken, for that both he and Mr. Booth, a great chemist here, considered that the different appearance of the chrystals in the deoxidized pieces of ore were only the different faces of the chrystals. But he is now perfectly convinced, from the specimens I have shewn him, that he and Mr. Booth are wrong in that opinion. I shewed him the chrystals belonging to each oxide in the black ore and had some of it stamped up, and took out before him with a magnet all the protoxide chrystals, while the peroxide remained unattracted by the magnet. Of the black ore, in 100 parts, from 80 to 85 parts is taken up by the magnet, and consequently there is only about 15 per cent. of it peroxide.

It is a little curious that this peroxide is extremely bright and glistening—the same in appearance as the East River ore, which we found in lumps up the small stream, and which I find is a pure peroxide—as not a particle of it has any attraction for the magnet. The Lake Sanford ore has more peroxide in it than the black, viz., from 27½ to 30 per cent. The fine grained ore has more still. The books on mineralogy, as well as mineralogists, have followed one another, saying that the black magnetic oxide contained two atoms of peroxide and one of protoxide, as a settled fact, and thus the great error that Professor Emmons was led into in describing the Adirondack ores in the new great work. Mr. Dobson says that he is anxious to place in his great work on iron all the particulars of this discovery of mine, which he considers will be of great importance in an economical point of view, and he wishes me to write out for him an article on the subject. He is now perfectly convinced of the fact, and that hitherto all the mineralogists have had erroneous notions on the subject.

The discovery shews the reason why the Peru ore works so well and certainly in the forge: because it is all protox-



Fig. 6.—Valley in Which Is Located "Upper Works." Ore Body on Both Sides of the River.

ide, and every particle of it reduced to the same state by the same degree of heat. The little vein of a foot wide at the Paradox Lake has always worked well: because it is all protoxide, and all reduced to iron with the same heat. At least the specimen had of that ore was all protoxide. Why has Pennfield's ore worked regularly in the forge? Because in sending it through the magnetic machine to get quit of the quartz, he got a pure protoxide. Why have the Adirondack ores never wrought regularly well? Because the two oxides were used together, which required different degrees of heat to reduce them, and there is not a bar of iron which has been made at Adirondack (except what little may have been made from the imperfectly separated ore) but on investigation will be found to be a mixture of steel and iron, in proportion of the two oxides in the ore. I have examined some of the bars lately and find this to be the fact. The magnetic separating machine was not invented to separate the two oxides, because they were considered to be chemically combined—it was to separate the ore from stoney matter. But now that machine will be found to be of great importance in doing what it was not invented to do—and will bring into play many valuable veins and beds of ore, in different parts of the country, which never could be worked, and it will vanish the vulgar and erroneous opinion that such and such an ore is "too rich to work well."

I sincerely trust and believe that before many months all this will be made practically manifest at Adirondack. But there is one thing I have found it—the ore must be stamp as fine as coarse sand to effect a proper separation. I took a piece of the black ore and broke it to the size of peas. The magnet took every piece of it up. Because, if a piece of protoxide chrystal adhered to a peroxide one, the former had sufficient attraction to take the latter along with it. But this is easily managed.

The size of the stamped ore must be proportioned to the size of the chrystals in the mass. The black ore, having large chrystals, would do perhaps at the size of split—the

Lake Sanford ore must be smaller—and the fine grained ore, from the minuteness of the crystals, must be as fine as river sand. The Clay plan of making iron, I am more and more convinced, will be the great thing for Adirondack, and that it will succeed after the separation of the oxides.

I have been enlarging on the iron subject, which I had no idea of doing when I commenced this letter.

An Early Magnetic Separator.

In January, 1843, Henderson had secured in Boston at a great bargain a magnetic machine built by Odiorne and writes that "the two cylinders contain 5000 magnets, which are all of the best steel. In June, 1843, the apparatus was in place, the stamping machinery well and substantially built, the water wheel and rest of machinery going as smooth as oil. The magnetic machine was attached to it, which did very well after regulating. The magnets, it is true, had lost a good deal of their power from having got wet in coming in; still they are sufficient for their present state to separate more ore than would be wanted for any intended operations."

Titaniferous Magnetite in the Forge.

The working of the protoxide in the forge proved a disappointment. The forgemen complained that "the ore does not make fast enough and the difficulty of getting just the proper heat to draw the loup into bars." It is characteristic of the man that he "tried one loup only of the peroxide part of the ore, or that which the magnets reject—the shining kind. This he run as he did the other, but it fell down to the bottom of his fire as a liquid and came out after it was cool in a plate of steel, so hard that a hammer made no impression upon it. In breaking some of it up, after a great deal of trouble, the grain was as fine and beautiful as cast steel and the cavities showing those brilliant colors which are taken for a test of the best blistered steel. Here is a proof that it was the peroxide part of the ore which gave our louns the tendency to run into steel. This is a curious material. We will try some more louns of the peroxide."

He appears, however, to have been much discouraged, saying: "I have expended upon it over \$33,000 a year; I believe a good deal more. I am compelled at length to consider it lost."

One cause of the trouble is found later on, the reference to which, in a letter dated at Jersey City, July 25, 1843, may be presented to show the spirit in which Henderson analyzes occurrences:

With regard to the 4 in. of water they found below the bottom of the fire—and it can only be a few inches from the bottom of it—I consider to be a serious impediment in the way of making iron. I have consulted with Mr. Steele on this matter and he is decidedly of this opinion. Water consists of about two parts hydrogen and one part oxygen. Being so near the bottom of the fire it must all go into steam and evaporate round and through the forming loup and the fire above. A very considerable portion of oxygen, therefore, must be continually operating upon the heated metal and the particles of ore falling into the loup and consequently producing an oxide of iron—at least to such an extent as to prevent the regular working of the ore. Since the water comes from a ceaseless spring out of the rocks above the forge fire, this cause has always operated against us from the first day the forge was built. The rock shelves down to the bottom of the fire which the water follows, and as the rock is higher on each side of the forge fire, the water lodges in a kind of natural basin in the rock just below the fire. It is a great pity that the forge floor had not been filled in 2 ft. more and consequently the fire 2 ft. higher, as every considerable freshet brings from 1 ft. to 18 in. of water into the forge.

Titanium the Bugbear.

It was in the summer of 1843 that titanium first appeared on the scene, the first reference to it being in the following letter dated Jersey City, July 13, from Henderson to MacIntyre:

Robertson told me an extraordinary thing, viz., that Professor Johnson told him that he had analyzed our ores and found that they contained from 16 to 18 per cent. of titanium in the shape of an acid. Professor John Murray of Edinburgh analyzed them and found only 7 per cent. of titanium and manganese, which is of no account whatever. The very best ores known in Russia and Sweden of the magnetic oxide contain a small portion of titanium. Murray was one of the first chemists in the world. Johnson



Fig. 7.—Views of the Old Blast Furnace at Tahawas, N. Y.

stands fair as a scientific man. What are we to believe? Beck gives no titanium. Mr. Steele says that what Johnson says is absolute nonsense—16 or 18 per cent. of titanium in it would totally prevent it from making iron at all. I place less and less confidence in many that are called scientific. I am determined, with the aid of Mr. Steele, to go through a perfect analysis myself, and then I will be satisfied. There is no difficulty in ascertaining about this titanium and the amount of it.

The sickness of Steele caused delay in making the analysis which these amateur chemists bravely undertook, unconscious of the difficulties which throw suspicion upon many figures of results dating decades later. The outcome is revealed in the following document written in Jersey City September 1, 1843:

Mr. Steele and I have been working away at the analysis of the ores—but we have come to a hole in the ballad. We cannot separate the protoxide and peroxide as held in solution as a precipitate of iron. Or rather, we suspect that in the manipulation the protoxide has imbibed oxygen and actually become a peroxide. All the authorities on analysis of ores throw no light on the subject. But we think we now know how to get at the proportions of these two oxides by chemical analysis, altho there is no time before my leaving to go on with it. It is a most curious subject. As regards titanium—it is present in all the three ores—viz.—the black—the fine grained and the Lake Sanford—but not in any quantity to do the least injury. In the black ore, we found about $1\frac{1}{4}$ per cent. of powder by the test, but that is not all pure titanium, which is almost impossible to get, but contains iron. How Mr. Johnson of Philadelphia could get from 16 to 18 per cent. of it is a mystery to us. Chilton says it is impossible. Mr. Steele spoke to him about it. When it is considered that the titanium of iron, according to the best authority, consists of protoxide and peroxide of iron 86 parts, titanous acid 8, oxide of manganese 2, gangue 1—loss 3-100 parts—what chance is there to get more than double that quantity out of our ore?

Tests at the Burden Works a Setback.

Later correspondence does not reveal that Henderson's theory of the two oxides in the ore was seriously shaken by the admitted presence of titanium. He seems to have been chiefly impressed with the extraordinary quality of the metal produced, and it was a very severe shock when a bar tested at Burden's was rejected as unfit for horse shoes and other purposes. He refers to his own tests, and tries to explain the cause, tracing it to the fact that the metal was not in the fire in the lumping long enough. A day later, on November 4, 1843, he reports on the tests of bars made by him: "I have had everything in the way of a hard test tried—horse shoes and horse shoe nails and even pieces hammered down to the size of needles which twisted around a pipe stem, had large pieces bent on angles without any giving—all the trials excited the wonder of both blacksmiths who declared that they had never wrought such iron. One of them said that he had used the best Russian and the Livingston iron which he considered the best American, and that neither of them would do what ours would, as it was so perfect at all heats. The result of these trials to day has made me think more highly than I ever did of the quality of the iron, if that were possible." Later on he reports having a piece of the bar which was sent to Troy, and which certainly was hard on one side, and it underwent the same tests as the others. He believes that the hammer is insufficient to make the iron solid or "well shingled at the first heat." He then speaks of having visited a large iron works in Philadelphia to see "the most perfect kind of hammer, Steele says, he ever saw. It is called a steam hammer and is an improvement upon the English. It is very simple in its construction, and under the most perfect control, yet it would take too much time at this late hour to describe it. The hammer itself weighs 1500 lb. and is capable of 80 beats in a minute. The height of the stroke can be regulated at pleasure. At the highest it comes down with a force of between 7 and 8 tons."

Striving for Quality.

We cannot help in conclusion printing the following letters dated November 30 and December 1, 1843, from Henderson & MacIntyre, because they throw a flood of light upon the opinions of one who was certainly a keen observer and an eager student of what literature was then available to him:

I assure you I am as much impressed as you are with the necessity in our proposed operations at Adirondack of producing an iron which will be uniformly of the very best quality—and that at this end we must feel our way, cautiously and gradually. That we have the materials capable of producing an iron equal to the very best in the world, I think there can be little doubt. In some respects the trial of the iron which you had at Burdens is fortunate, for it will always keep us on the lookout. At the same time the result of that trial astonished me not a little—for I have not been able to find any instance of such breaking in any of the bars which came down even when the whole was bent.

The very bar from which the trial was made even shewed no such result. But I will take it to Cooper's and have it drawn thru the rollers to horse shoe sizes and see if it breaks as it did at Burdens. As I stated before, the horse shoe nails which were made there and sent down to me were alloyed with copper, and I have thought it strange that they should have tested the iron for nails in a coppery fire. In that bar the fracture did not appear perfect, altho it made no difference to the iron in the blacksmith's fire. You remarked that Mr. Burden said he could get no iron fit to make horse shoe nails but the old Sable. Now I will bet \$100, altho betting is no argument, that each and every bar that came down will make as good nails as any old Sable in the world. I am so confident because I have had a number made by the best judges—some of which Mr. Strong took up with him. In no instance have I seen a nail fail, nor in sharpening the points when cold, which was not the case with the railroad iron tried against ours, and which was called the best. The only imperfections in these bars (save the one perhaps which you took to Burdens) is little longitudinal slits from the imperfect welding, and which are occasionally seen in the old Sable and other good irons; and the blacksmiths say they are a sign of the very best iron, for what reason of theirs I know not. We had not a hammer fit for perfect shingling and everything else was not in perfect order.

All authorities agree that lumping good white metal in a charcoal fire makes the very best iron if carefully decarbonized, and in the ordinary case this can be done uniformly and regularly. I have no doubt it can be done cheaper in a reverberatory furnace, but we have yet to know whether the iron would be as good. Every bar must be tested when taken from the lumpers or hammers—and there is a simple way of doing it.

Metallurgical Theories.

You know we have been of opinion that our black ore will run into nothing else but the silvery white metal.

After having read Mushet and everything I have been able to lay my hands on I have changed my opinion entirely on this point. It indeed will run into nothing but white metal in the forge fire, because it is so short a time in contact with the charcoal that the metal does not become sufficiently carbonated to be anything else but a white. There are a great variety of white metals; some so bad as to be fit only for weights, &c. Our beautiful metal seems so pure and rich that it is equivalent to the refined white which is produced by the repeated running of the best pig.

It is believed that iron as a simple metal is all of one quality, and when we say that such an iron ore makes bad iron, we mean, properly speaking, that such an ore contains other substances associated with the iron which prevent the latter from being reduced in a pure state; that is, the iron forms an alloy with some mineral or minerals of a nature deleterious to the quality of the iron. Our ores, on the contrary, seem to be remarkably free from such associations and, melting at a comparatively low heat, give out a pure and unadulterated metal.

In smelting our ore in the proposed furnace, and not using any flux but what is in the ore, and especially if we use a strong blast, the charges will travel fast down the furnace, and the resulting iron will be a silvery white, and what I am of opinion is necessary for making the very best iron by the lumping process. But in obtaining such metal in this way, we by no means get anything like all the iron which the ore contains, perhaps not more than half of it. This would be considered an imperfect fusion of the ore, which would be manifest by the application of the magnet to the pounded black cinder.

But if smaller charges were used than in the above process, yet in a greater proportion of ore to the charcoal, and in addition the requisite portion of lime, &c., as a flux—the abundant flux would enlarge the points of contact between the particles of ore and charcoal—the charges would be longer in traveling down the furnace and the consequence would be a carbonization of the iron, taking away its whiteness, and it would be soft, gray or black pig, according to the mixtures in the furnace and extent of blast. If the flux should be of a kind suitable to the ore, and in the proper proportions to ensure what is called a perfect fusion, the cinder would be glassy and only slightly colored, containing little or no iron in appreciable quantity and the

quantity of metal produced would be within a per cent. or two of what the ore contains by analysis. This would be called a perfect fusion of the ore.

A greater quantity of white metal can be run in a day from a furnace than grey or black pig. They run the Dannemora ore, it would appear, at once into a silvery bright metal—no doubt similar to ours. Where ores are high in price, a perfect fusion of them, to get out all the metal, is exceedingly important. At Adirondack it is otherwise; we can afford to run a white metal at once. Lime appears to be universally used in furnaces to aid the carbonization of the metal. Perhaps the carbonic acid which it contains assists materially in this. It is also used to secure a perfect fusion of the ores.

It is well that we begin with a small furnace. Whether we will require to use any flux for our object is a question which can only be answered by experiment. We are certain that the ore contains a flux of itself to accomplish a fusion to a certain extent—altho not a perfect one. But we have such an abundance of ore at hand, and, as I before said, we can afford to manufacture, without getting all the iron it contains out of it. And we must recollect that by using much foreign material as fluxes, an additional amount of fuel is necessary for their fusion also, so what is lost by the one may be gained in the other. We will at all events

Adirondack as anywhere else, only a turning lathe and some tools would require to be sent in. In that letter I said something on the subject of hammers. I have not yet written Taylor of Port Henry about the castings for the lumping fires. I first want to go with John Steele to the Sterling Works, where they have used such fires.

I must write Porteous to get a few loads of pure limestone this winter from Pendleton, in case some should be actually necessary for flux—altho I am inclined at present to think our trap has enough of it to answer our purpose.

Mushet gives an account of a wood charcoal furnace in England (not now running) where they used the rich Lancashire peroxide—26 ft. high, 9 ft. wide at boshes. All the flux used was 2 lb. of lime to 112 lb. of iron ore, or the one-fifty-sixth part. This was used when forge pigs were wanted—when a softer pig was required about 3 lb. to the 112 lb. of ore was used.

The purer and richer the ore the less flux is necessary, especially if the ore contains a flux of its own, and is so easily melted as ours. There are, however, many very rich yet refractory ores, hard to melt, and which require a great deal of flux to run them in a furnace; such are some of those at Port Henry furnaces. I wish I had a little assay furnace here, as I could spend some time in making experiments, profitably, I think, by making many trials of dif-

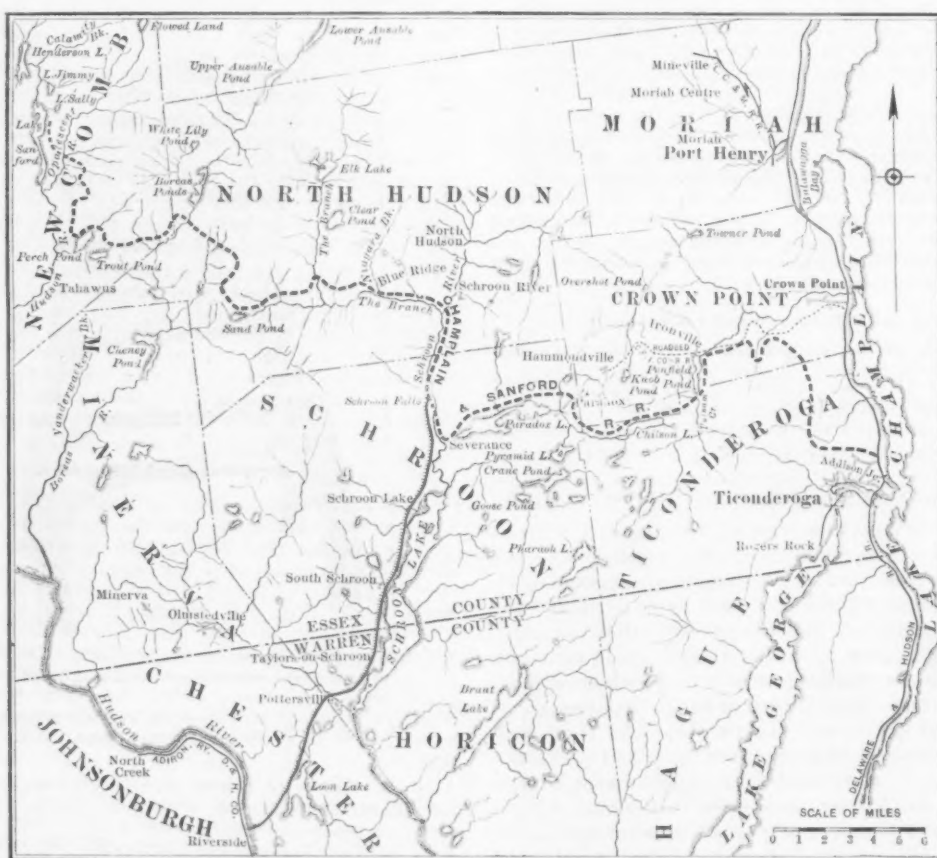


Fig. 8.—Map Showing the Railroad Connections.

require to make some soft pig metal for the purpose of castings for the rolling mill, &c., and I am sure we can do it, but we will want some lime for this purpose, provided our trap, which contains a little lime, will be found not sufficient.

It is now essentially necessary that we analyze the earthy matters of our ores and ascertain what they really are. There is from 8 to 15 per cent. of a blueish powder left after the muriatic acid has taken up all the iron. We must also analyze the feldspar and see whether the flux in that is potash or lime. And above all I want to analyze our trap, but I find I have none of it. Have you any? I think that you took a specimen last time you were there—if so, you must send it to me. In view of our smelting, it is very important to know its composition—it runs easily and very thin—and may be of great consequence in our operations as a flux. As I mean to make some trials this winter in the assay way with our ores and different proportions for fluxes, I would give a good deal for half a dozen pounds or so of our trap rock. I must write Porteous to send it if he can get an opportunity. Root talked of coming to Albany this winter.

I wrote you by Mr. Strong informing you of our unsuccessful journey to Schuylkill County, Pa., in search of a rolling mill. John Steele says if we can produce some soft pig for castings, a rolling mill can be made as cheap at

ferent proportions of charcoal, ore and such fluxes as our region affords, and in ascertaining whether a soft pig could be made from these, or how little lime in addition would suffice to make it. You may read and read, and it is well to read; yet, after all, when you are dealing with new materials, and, indeed, with ores different in several respects from all others, nothing but actual experiment can throw light on the subject. Mr. Mushet attests to the great value of assays in crucibles, as regards resulting metal from various proportions of ore, fuel and flux, and how often they are borne out by operations on a large scale.

"A Mania for Iron Chemistry."

In a letter dated Jersey City, December 1, 1843, David Henderson writes to A. W. MacIntyre:

You seem to be fairly inoculated as well as myself with a mania for iron chemistry. It is certainly a deeply interesting subject of itself, but take it as having a bearing on that peculiar iron region of ours, it is well worthy of all the investigation which we can spare time to bestow upon it, not only as a prospective pecuniary benefit to ourselves, but as a highly important benefit to the country at large.

I received the piece of trap by Mr. Strong. I hope Porteous will have a chance of sending me a dozen pounds of it for trials in the assay made. You say, "If the unsmelt-

ed ore in the furnace, when running for white plate metal, finds its way into the cinder, and that none of it gets into the smelted iron, it is very well." If you place a piece of ore into a very high heat at once—at a melting heat, without having been for some time previously in contact with carbon to take off the oxygen, the result will be a slag—the iron and earthy matter both melted together, and in the most intimate chemical union. But place a piece of ore which has been previously oxydized in a melting heat at once, and the result will be a fusion of both the iron and earth, but not in chemical union—the melted iron will be below and the melted earthy matter on the top.

Perfect deoxidation, therefore, before melting effects a mechanical separation of the iron and earthy matter when melted. For instance, when we run white metal in the forge fire, it is evident that all the ore is not properly deoxidized, because we find that the cinder contains iron—and what iron this cinder does contain is the product of ore which still contained oxygen when it came in contact with the melting heat. According to my view of this matter, and which I take from a knowledge of the chemical affinities, no unmelted ore in the furnace can get into or combine with the melted iron—that is, provided a melting heat is kept up. And, further, if this is the case, that it is utterly impossible to have any unmelted ore, either in the melted iron or in the cinder. We have seen, in the forge fire, by overloading it with ore, a kind of half melted ore as the result, but then we must recollect that the overloading destroyed the intensity of the heat, so as only to melt imperfectly. I think you will agree with me in this rationale of the matter in question.

To get a perfect fusion of any ore, that is, a fusion to separate all the iron from the earthy matter, very considerable flux is wanted and more fuel in proportion, for the additional iron to be obtained by the perfect fusion, because much fuel is wanted to melt the fluxing materials. But the ore is as cheap to us as any fluxing materials, and our course is plain—we must have a sufficient strong blast, and run as much of that beautiful white metal as possible from a certain quantity of fuel. In short, we must sacrifice ore to save fuel and gain time. To make bar iron from such white metal as ours is easier done, and takes less fuel than from a more highly carbonated pig metal. It is my opinion that if our ore melts as easily in the furnace as it does in the forge, it will be to our advantage and profits not to use any flux at all; except when we want to make a more carbonated and softer metal for the purpose of castings, when we will require to use a good deal of it.

A Succession of Hopes Raised and Shattered.

Thus the adventurers struggled on. Visits were made to distant works, or information collected through others of practice elsewhere. There were eager discussions of the best hight to select for a new furnace to be built to produce the "silvery white plate metal," Henderson's idea being that the peroxide part of the ore could be run off with the cinder, because it will not be deprived of its oxygen when it arrives at the melting heat. The furnace was completed toward the end of June, 1844. In October of that year a record of 2153 lb. on one day and of 2345 lb. on the next day is recorded with the comment that "she must come to 30 cwt. gross and Adirondack will keep itself in operation by and bye without further advances." In November, 1844, however, Henderson writes that he is glad that the furnace is blown out, "for in the state she was, it was making iron at too great a sacrifice of coal."

At the same time the suggestion is made to write to Colonel Totten to ask whether he could get the refined iron tried by the Government at the works near Washington. Still the enterprise does not seem to have prospered since MacIntyre in a letter dated April 4, 1848, complains that he had sent to the works in five months \$24,995, adding: "How comes the expenditure to be so enormous? I much fear our iron costs more, much more, than your calculations."

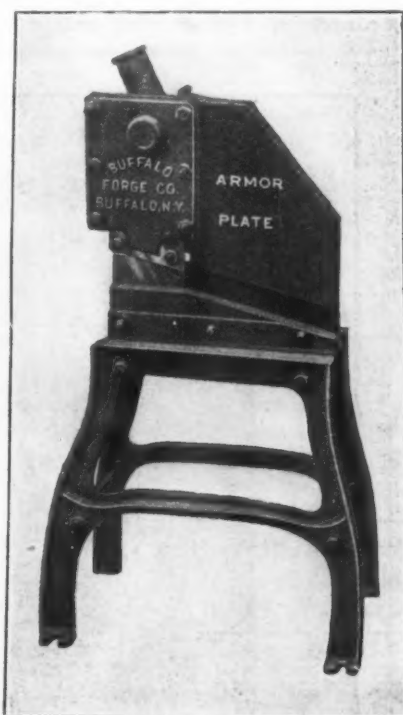
In the same year a Mr. Hodge submitted propositions to improve the working of the furnace, which, according to the correspondence, was only making 18 tons per week at a cost of 200 bushels of charcoal per ton and the cost at Adirondack was at least from \$20 to \$22.50 per ton. Hodge claimed to be able to get the yield up to 45 tons per week and the fuel consumption down to 150 bushels per ton, but failed. This again brought up the question of titanium, through an analysis made by a Mr. Hays, and it was then that the question is first raised of making an analysis of the cast steel to determine whether it, too, contained titanium. The records do not show what

results were reached. They probably added to the perplexities.

So far as can be learned, the enterprise was fairly self-sustaining for a brief period, but the greater part of its history was an endless succession of hopes raised and shattered, the one encouraging feature being the quality of the product and, to a secondary degree, the enormous extent of the deposits, which was clearly recognized at a very early date.

A Buffalo Hand Power Slitting Shear.

A hand power slitting shear, designed to cut metal of any width up to $\frac{1}{4}$ in. thick, known as the Buffalo armor plate slitting shear, No. 22, has recently been placed on the market by the Buffalo Forge Company, Buffalo, N. Y. A feature of the machine is its compactness for the class of work for which it is designed. It is declared to be the lightest and strongest machine of



The No. 22 Slitting Shear with Armor Plate Frame Made by the Buffalo Forge Company, Buffalo, N. Y.

its capacity built. In the construction of the framework armor plate, which is tough and tenacious and has a high elastic limit, is used so that the machine may be well adapted to withstand the severe strains and shocks to which it is subjected in use.

All the working parts are drop forgings, and are carefully machined and accurately fitted to prevent any lost motion or back lash. The plunger operating the knives is actuated by an eccentric fitted to the lever axis. This construction is simple, consisting of few parts, so that there may be but little chance of its getting out of order. The knives are of crucible steel, accurately ground and fitted, so that they may not give at the points nor chew the edges of the work, but cut it straight and clean. The offset in the frame is designed to prevent binding and guide the metal accurately in a straight line.

The Banning-Connellsville Coke Company, recently organized, has purchased the Banning farm of 500 acres, near Uniontown, Pa. The tract is estimated to include 80 acres of coking coal, while the other land is underlaid with Freeport coal, which now has a value. The company will build 75 bee-hive coke avens at once, half of which are expected to be in operation in January next. Elias Wineland is president; E. H. Abraham, vice-president and general manager, and R. W. Gilmore, secretary and treasurer.

The Improved Dresses Universal Monitor Lathe.

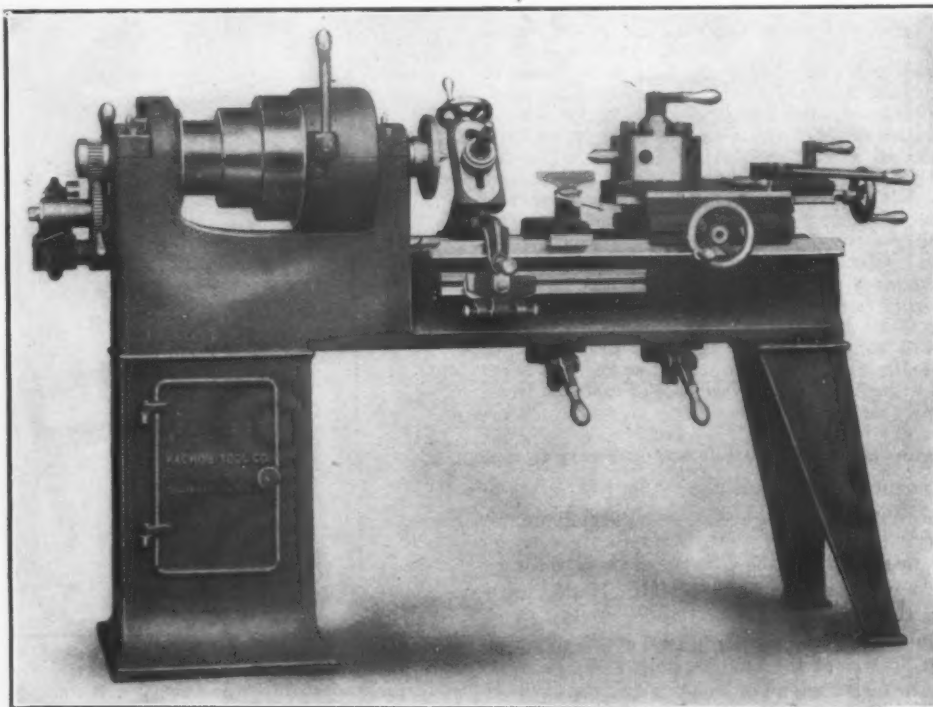
The redesigned 16-in. universal lathe built by the Dresses Machine Tool Company, Cincinnati, Ohio, is principally for high speed and relatively light work, such as that done on brass working lathes. The head and bed of the machine are cast in one piece and the friction back gearing is entirely inclosed. The friction in the head is of the toggle joint type and is so designed that the entire operating mechanism can be put in place or removed without taking out the spindle. The spindle bearings are of babbitt metal.

The chasing bar has a yielding follower holder, maintaining contact with the leader when chasing taper work. The taper attachment is provided with knurled screws for minute adjustment. It is placed separately on the bed below the V's, so it can be left undisturbed and is out of the way when the chasing head is tilted back and the hand rest, a slide rest, or cutting off rest is in use. The connection between the leader stud and spindle is made by tumbler gears, and either right or

streets, Pittsburgh, has begun the construction of fifteen double axle cutting off and centering lathes, to cut off axles up to 13 in. in diameter, for the Indiana Steel Company, Gary, Ind. These machines are to be of heavy construction, each operated by three motors, and specially built to comply with the steel company's requirements, which include that all overhead belts shall be eliminated, and the gear driving and feed mechanism located in the rear of the machine, out of the way of material and operator. The Fawcus Machine Company is also manufacturing machinery and gears for some bascule bridges and filling contracts for cut gears for a variety of purposes.

The Osterberg Tin Plate Company.

The Waynesburg Forge, Sheet & Tin Mills, Waynesburg, Pa., which were recently purchased by capitalists of that city for \$22,000, will be operated by a new company, to be called the Osterberg Tin Plate Company. It is the intention of the new owners to spend sufficient money to make the plant up to date in every respect, and



The Redesigned 16-In. Universal Monitor Lathe Built by the Dresses Machine Tool Company, Cincinnati, Ohio.

left hand threads can be chased without changing the leader and follower.

The turret slide, as is suggested in the name, has setover and swivel adjustments. The latter is graduated in degrees on the saddle carrying the top slide, the former on the cross feed hand wheel hub. The top slide has combined lever and screw feed, and the change from one to the other is quickly made by tightening or loosening the horizontal handle shown at the rear of the top slide. All slides have taper adjusting gits. The turret is locked by a gibbed square key, and both the index ring in the turret and key are hardened. In returning the top slide the locking key withdraws automatically, the operator using his left hand for revolving the turret. This feature responds quite as quickly as an automatic arrangement and avoids a complicated lever and trigger mechanism necessary to the automatic revolving movement.

The bed is supported at the head end by a cabinet leg containing shelves and serves as a tool receptacle. The tail end leg is attached in a hinged manner, so that the machine has three-point support and cannot be thrown out of alignment or the bed twisted when bolted to the floor.

Fawcus Axle Lathes for the Gary Works.—The Fawcus Machine Company, Twenty-eighth and Smallman

equipment of the latest design will be installed for the handling and turning out of its products. The forge and bar mill part of the plant will not be operated and enough of the unnecessary equipment is being disposed of to cover almost the original price paid for the plant.

H. Osterberg, general manager, and H. J. Scanlon, superintendent of the new company, have had 18 years' experience in the tin plate business, having been connected with the old United States Iron & Tin Plate Company, which operated one of the first tin plate plants in the United States, and since the formation of the American Sheet & Tin Plate Company have been connected with several of that company's plants. Mr. Osterberg was manager of the United States Works of the American Sheet & Tin Plate Company for about three years. Both have lately been connected with the Washington Tin Plate Company, Washington, Pa. The other officers of the company are local capitalists and are as follows: I. N. Kuhn, president; R. L. Hoskinson, vice-president; Ellis B. Bailly, secretary, and R. R. Hardesty, treasurer.

The Alaska-Yukon-Pacific Exposition, Seattle, Wash., has awarded grand prizes (highest award) for insulated wires and cables to the General Electric Company and the John A. Roebling's Sons Company.

The Newark Foundrymen's Association.

The Newark (N. J.) Foundrymen's Association held its first fall meeting in the Continental Hotel on the evening of October 6 and listened to an address on "The Importance of a Chemist to the Foundryman," which was made by C. L. W. Pettee of the Hartford Laboratory, Hartford, Conn. Mr. Pettee gave a general talk on what the chemist can do for the foundryman and later told of some practical experiences foundrymen have had after securing the assistance of a chemist in making their foundry mixture. He said in part:

I have in mind a foundry that began to employ a chemist some time ago, and six weeks later its own figures showed a decrease in hardness of 25 per cent., an increase of transverse strength of 6 per cent., and a gain in toughness shown by an increase in deflection of 12 per cent. I have in mind another foundry that was unable to produce all the castings it required, and doubled its capacity for the reason that experiments it made showed that it was able to machine 20 per cent. more of the castings of its own make than the best castings it could buy outside.

A large concern that also employed a chemist on the first purchase of iron it made effected a saving on 1200 tons of iron of about \$2500 from the price it would have paid for the same irons it had previously bought, and there was a very great improvement in the quality, which resulted in a great saving in the loss of castings. At the time it began to use a chemist it was losing 16 per cent. of its castings, and during the first year this loss was reduced to less than 3 per cent., making a saving of over \$20,000 in the year. The castings were stronger and machined very much more readily than the old mixture, being, to use the company's own words, "sound and free working castings."

Still another foundry was trying to cast some large hollow cylinders, which were 14 ft. long, 48½ in. in diameter, and 1¼ in. thick, weighing 9000 lb. When it began to employ a chemist it had lost the last six which it had cast. The chemist analyzed the materials, gave a mixture, and the foundry cast two cylinders the same week, which the manager wrote came perfect, and "evidently you have helped us out of a very bad hole." At the end of four years this foundry states that it has not lost one of these cylinders and that the mixture given had cost from \$5 to \$6 less per cylinder than the mixture which it had been using, and if it ever did save one before it cost from \$12 to \$20 to plug it, and that was liable to be discovered, and this was not a nice thing to happen, and that it was making equally good savings on gears and other castings. This foundry was using a mixture much too rich for these large castings, and, following the chemist's advice, bought lower priced iron, with this much better result. The first mixture given was 40 per cent. of the poorest (lowest silicon) iron the foundry had in its yard and 60 per cent. of its largest scrap.

Another foundry previous to employing a chemist, in casting a chuck for an English concern, stated that it lost 63 chucks, weighing about 600 lb., before getting a good one. After the employment of a chemist a good one was always had on the first attempt.

I could cite innumerable instances of this sort which have come under my observation in the past few years, but probably these are sufficient.

An interesting discussion followed Mr. Pettee's address, participated in by several members of the association. While some thought that a foundry foreman should be capable of judging his cupola mixture, the general impression was that such foremen are hard to obtain and most of the speakers favored calling in a chemist to help in solving their problems.

An interesting sidelight on the difficulties foundrymen have had in getting apprentices to take a foundry course in technical schools was illustrated by Arthur A. Barlow of the Barlow Foundry Company, who told how one of the company's apprentices was delegated by the rest to investigate possibilities of the course to be opened in the Newark Technical School and he returned and informed his mates that the examination was too hard, whereupon the others gave up all idea of taking the course. J. B. Bernhard of the Thatcher Furnace Company, Ulrich Eberhardt of Gould & Eberhardt, and Franklin Phillips of the Hewes & Phillips Iron Works reported that they had had the same difficulty in getting their apprentices to take the course. It was pointed out that the average foundry apprentice was hardly fitted to undertake a difficult examination, and at the suggestion of Mr. Phillips, the Executive Committee of the association was delegated to call on the faculty of the Newark

Technical School and request that the entrance examinations be waived for the ensuing year, or in other words, that the boys be schooled up to the point where they can pass the elementary examination.

David Spence of the Essex Foundry spoke on the subject of "Industrial Education" and stated that the best help that can be given to the foundrymen by technical publications is to report actual experience in foundry practice, rather than discuss theories, in order that foundrymen might profit from the experience of others in the same line.

Lake Iron Ore Shipments by Ports.

The September shipments of Lake Superior iron ores from upper lake docks, as already reported in total in these columns, brought the total for the season to 29,639,533 tons, as against 16,630,960 tons to October 1, 1908, an increase of 78 per cent. It will be noticed that the shipments from Minnesota are more than two-thirds of the total to October 1, Duluth, Superior and Two Harbors together supplying 71.64 per cent. The figures are for gross tons:

	Sept. 1909.	Sept. 1908.	To Oct. 1, 1909.	To Oct. 1, 1908.
Escanaba	948,951	654,679	4,002,796	2,006,192
Marquette	565,949	245,768	1,979,517	871,107
Ashland	721,236	483,961	2,422,004	1,521,146
Superior	1,057,175	541,235	4,743,498	2,264,443
Duluth	2,133,800	1,617,134	9,847,177	6,201,121
Two Harbors.....	1,623,874	1,103,307	6,644,541	3,766,951
	7,050,985	4,646,024	29,639,533	16,630,960

The August total was 7,193,199 tons, and that for July 6,693,025 tons. In the record year, 1907, the total of Lake Superior ore shipments was 42,245,070 tons, but of this 956,315 tons was shipped by all rail routes, the water shipments being 41,288,755 tons. If October and November should have an average of 6,000,000 tons each, which would be quite beyond any records in those months, the 1907 record would be exceeded, and this is now expected by some shippers.

The Best Blast Furnace Records.

In connection with the figures for the best blast furnace records in the United States for one day, one week and one month printed in *The Iron Age* of September 30, page 999, and of October 7, page 1084, the following will be of interest: It is a tabulation of the best records made by the Carnegie Steel Company. All were at the Edgar Thomson group of furnaces, Rankin, Pa., and these records have not been exceeded by any other furnace plant of the Carnegie Steel Company:

No. of Furnaces.	Edgar Thomson.	Gross Tons.	Dates.
Best day....1	K	918	March 30, 1905
Best week....1	K	5,116	March 24 to April 1, 1905
Best month...1	K	21,272	March, 1905
Best week....4	E, F, G, K	19,578	October 7-13, 1906
Best month...4	E, F, G, K	82,301	October, 1906

The Middletown Car Works, Middletown, Pa., was taken possession of, by purchase, on October 1 by the Middletown Car Company, operated by the same interests as the Standard Steel Car Company. Arthur King, who was president of the Middletown Car Works, has been retained in the same official position by the new company. This plant has recently been operated under the supervision of an Advisory Committee of creditors of the old company.

The Lawrence Iron & Steel Foundry Company, a Pennsylvania corporation, has succeeded the Yagle Foundry & Machine Company, Ltd., Pittsburgh. The new company has placed an order for the erection of an open hearth furnace, and will soon have in operation a steel foundry department for the manufacture of open hearth steel castings. William Yagle is secretary of the new company.

The Cooper Gas Engine.

In thermal efficiency the gas engine is superior to the steam engine, but in regulation and reliability it is usually not so good. As a long time builder of steam engines, the C. & G. Cooper Company, Mt. Vernon, Ohio, realizes the latter two advantages of steam engines, and before giving publicity to its new gas engine, which it has been developing for some time, felt that it was necessary to have the regulation and reliability of the gas

four-stroke cycle, with the gas and air supplied in permanently fixed proportion—i. e., a constant mixture. Both the air and gas are distributed from the center of the engine, so that they travel an equal distance and with equal resistance to the respective intake valves of the cylinders. The mixture in all cylinders, therefore, must be identically the same in volume and composition under all conditions of load. Similarly the cooling water is introduced into the piston rods from a central point and passes through each piston and piston rod

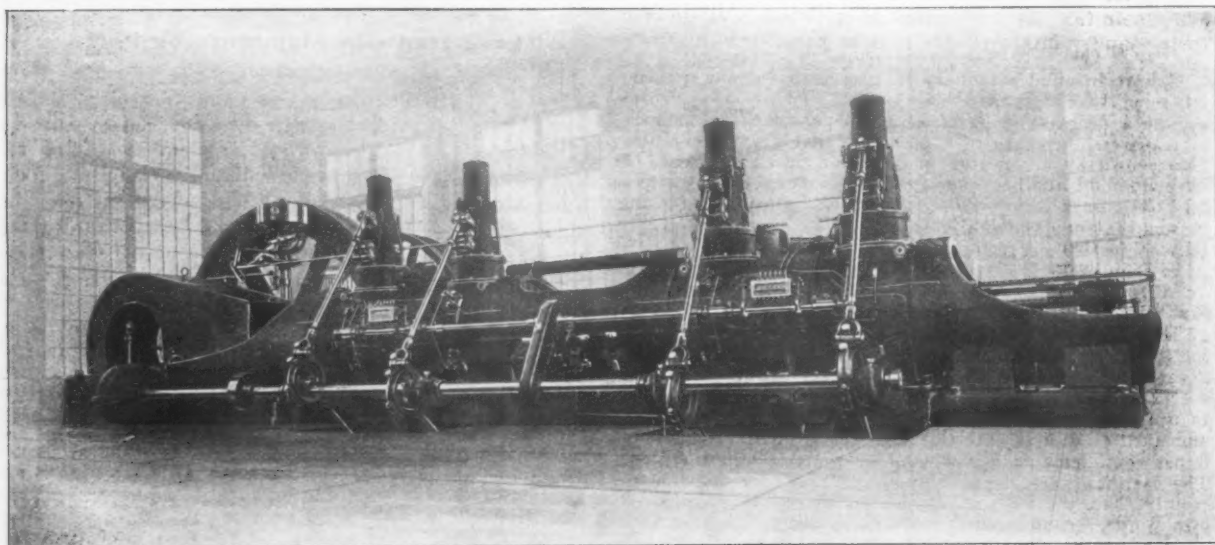


Fig. 1.—A Two-Cylinder Tandem Double Acting Gas Engine Built by the C. & G. Cooper Company, Mt. Vernon, Ohio.

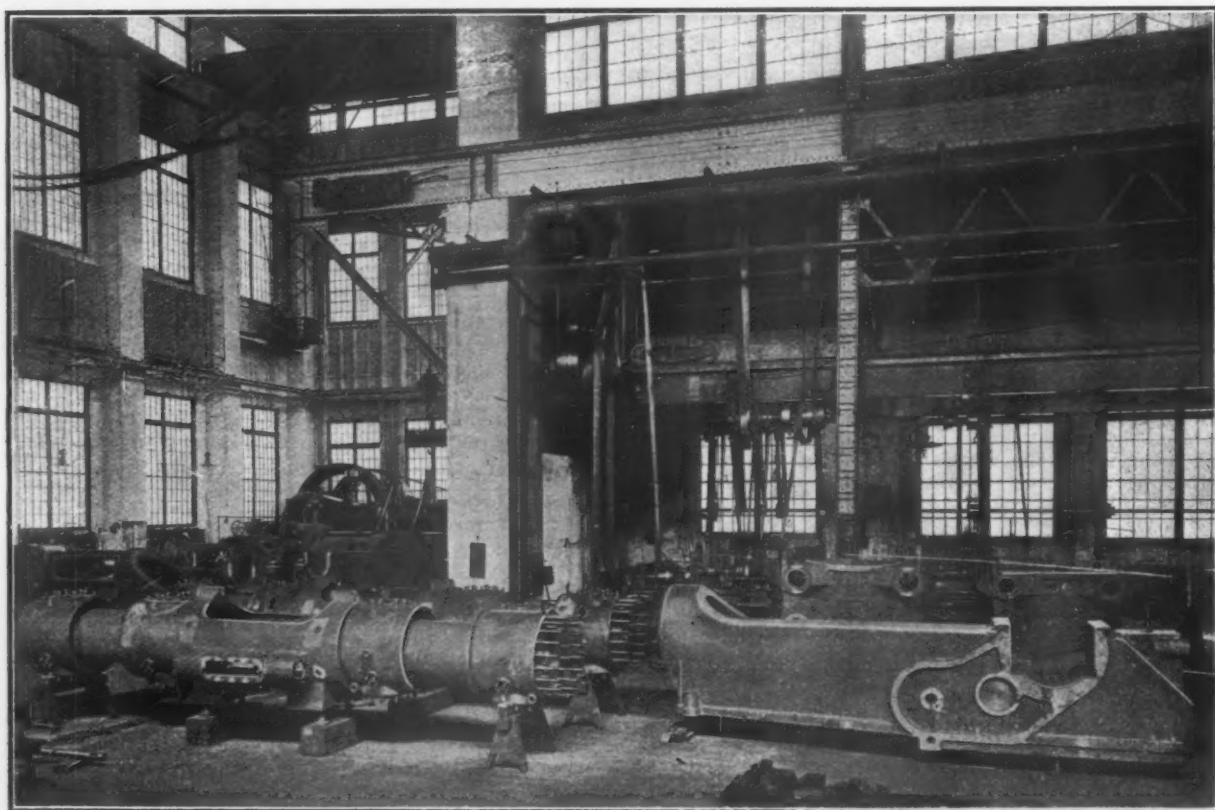


Fig. 2.—A View in the Erecting Shop, Showing the Unassembled Cylinders and Bed of a Large Gas Engine.

engine equal to that of any high grade steam engine. From endurance trials in service which have been made this is now believed to have been accomplished. The Cooper gas engine is the design of an expert in this field, Martin A. Thiel, a German engineer, who has had many years' experience in designing and building large gas engines, and contains many original features, particularly in the ignition, timed lubrication, cooling and regulation.

Fig. 1 is a view of the valve gear side of the new gas engine. It is a double acting engine and operates on the

without reversing the flow to the outlets at the forward and rear ends of the engine. The overhanging counterbalanced type of crank has been adopted.

The bed is of the heavy duty rolling mill type, having an open top, permitting access to the crosshead and easy removal of the cylinder head and piston through the bed. The bed is rigidly bolted to the foundation, while the distance pieces and tail rod supports, which are of cylindrical construction, rest on base plates in machined ways. Fig. 2 shows the cylinders and bed of an engine before assembling in the company's erecting

shop. The main bearing is of special design. The lower shell rests in a bored seat and may be easily removed after relieving it of the weight of the shaft. This shell is babbitted and cored for water cooling. The side gibs are provided with wedge adjustment on either side and are lined with babbitt. The cap is babbitted at the ends only and is used to clamp the quarter boxes and the bottom shell into place. In addition there

is a transverse rib on either side of the cap extending the length of the bearing, which provides a retaining wall for the oil and compels it to enter the bearing above the side gibs.

The cross head is fitted with an improved flat shoe, the top face of which is bored to allow the cross head pin to align itself with the crank pin should the latter be thrown out of a horizontal plane by shaft deflection. All pistons and piston rods are the same and are interchangeable. The pistons contain no ribs and float on hollow rods between the main, intermediate and supplementary cross heads. The rods are nickel-steel forgings, are drilled for water circulation and are forced into the pistons.

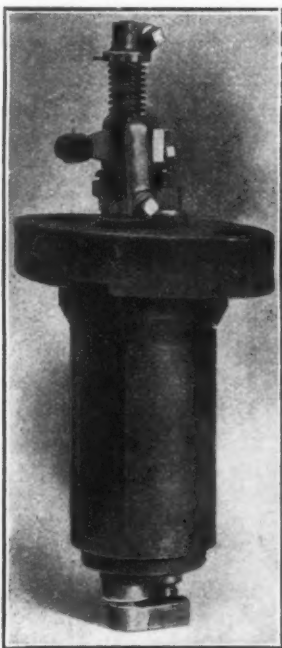


Fig. 3.—An Igniter.

The cylinders are one-piece barrels, with the inlet and exhaust chambers cast separately and bolted to them, so as to avoid all cooling strains in the castings. The water jacket is closed at its center by a belt in three segments. The cylinders are supported only at the ends by the main bed and guide castings, and as

the piston and rods are carried by their respective cross heads, the cylinder barrels are permitted to expand and contract with freedom. The exhaust piping is of flexible construction throughout, insuring free movement for expansion and contraction due to changes of temperature.

The ignition is of the make-and-break mechanically operated type, and two or more igniters, one of which is shown in Fig. 3, are operated simultaneously at each end of each cylinder. This system is connected with a safety stop, which automatically breaks the electric circuit when the engine speed exceeds 10 per cent. above normal or the cooling water supply fails. The engine is regulated by varying the quantity of a constant mixture controlled by the governor through an automatic relay. The lay shaft is driven by spur and bevel gears. It is supported by bearings on the engine bed and base plates, thus departing from the common practice of supporting it on bearings from the cylinders, where they are subjected to temperature changes, or from the foundation, where it is difficult to maintain proper alignment. This self-contained construction has the additional advantage of permitting the removal of the cylinders without disturbing the lay shaft bearings.

The inlet and exhaust valves at each end of each cylinder are actuated by a single eccentric on the lay shaft. The connections and the construction of the valves may be seen in the cross section through a cylinder given in Fig. 4. The exhaust valve is of the separate cage water cooled type. The gas regulator is of a special oil sealed inclosed construction with balanced valve.

Aside from the combination in this engine of features essential to the best results in a gas engine, the construction details common to all reciprocating engines, such as bearings, connecting rods, &c., have been worked out with special care and skill. The design and performance of this engine, it is reported, are regarded as remarkable by many prominent gas engineers who have inspected it. The company is prepared to build gas engines in single tandem and double tandem units of from 150 to 3000 hp. capacity. It is one of the few large companies now devoting its attention and facilities exclusively to the building of steam and gas engines.

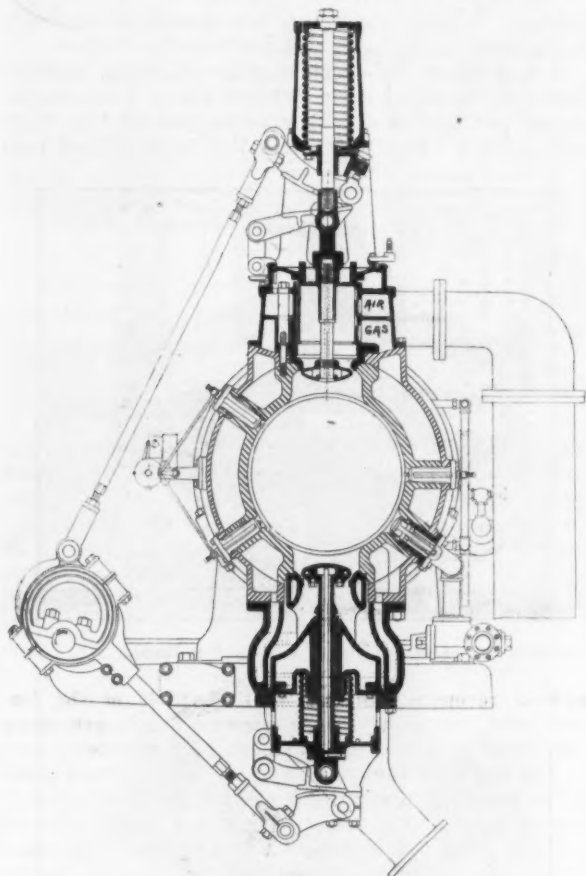


Fig. 4.—Cross Section Through a Cylinder, Showing the Operation of the Valves.

The Sheffield Gas Power Company, Sheffield Station, Kansas City, Mo., has purchased the entire assets, factory, &c., of the former Weber Gas Engine Company at bankruptcy sale. The factory has been in continuous operation throughout the term of the receivership, so that the new company is in position to furnish, without delay to any customer, the entire line of Weber gas engines and gas producers. The management of the business and the sales and factory departments are in entirely new hands. George M. Hawes, the president of the company, a graduate of the Massachusetts Institute of Technology, has been interested in machinery and electrical work for a number of years and has devoted much time to gas engine and producer design. Freeman Field, vice-president and treasurer, has devoted the past 12 years exclusively to the gas engine business, both in the manufacturing and selling branches, and for the past seven years has been connected with the Olds Gas Power Company as general sales manager and Western manager. W. H. Spiller, assistant manager, studied at Harvard and Brown universities along the lines of electrical and mechanical engineering, and is thoroughly posted on power plant installations, having installed both steam and gas power in many different industries. During the past six years he has been affiliated with gas power interests in both selling and manufacturing lines.

The Brown-Ketcham Iron Works, Indianapolis, Ind., has enrolled its 40 apprentices at the night school of the local Y. M. C. A., paying the tuition fees in advance, permitting the apprentices to refund the money on the instalment plan. The majority of them left school at an early age to begin work. They will enter the elementary grades, preparatory to taking the course in ornamental iron drafting, the more advanced entering the drafting course direct.

A New Ransom Disk Grinder.

Not a few of the recent improvements in metal working tools are directly traceable to the stimulating influence of the automobile industry, which within a few years has become a powerful factor in the machine tool trade. A case in point is presented in the 27-in. disk grinder and clamp here illustrated. These tools are the latest products of the Ransom Mfg. Company, Oshkosh, Wis., by whom they were especially designed to meet the requirements of automobile manufacturers for facing

Steel disks of either 23 or 27 in. diameter may be used, and are secured to the arbor by bolts and nuts instead of by the usual method of countersunk screws. To grind duplicate parts to the same thickness adjustable stop screws are provided.

The countershaft from which the machine is driven has ring oiling hangers and a ground shaft, while the loose pulley has a phosphor bronze bushing fastened to the shaft, by means of which this pulley is continually lubricated whether the belt is running on the tight or loose pulley. Oil sufficient to last several weeks is thus

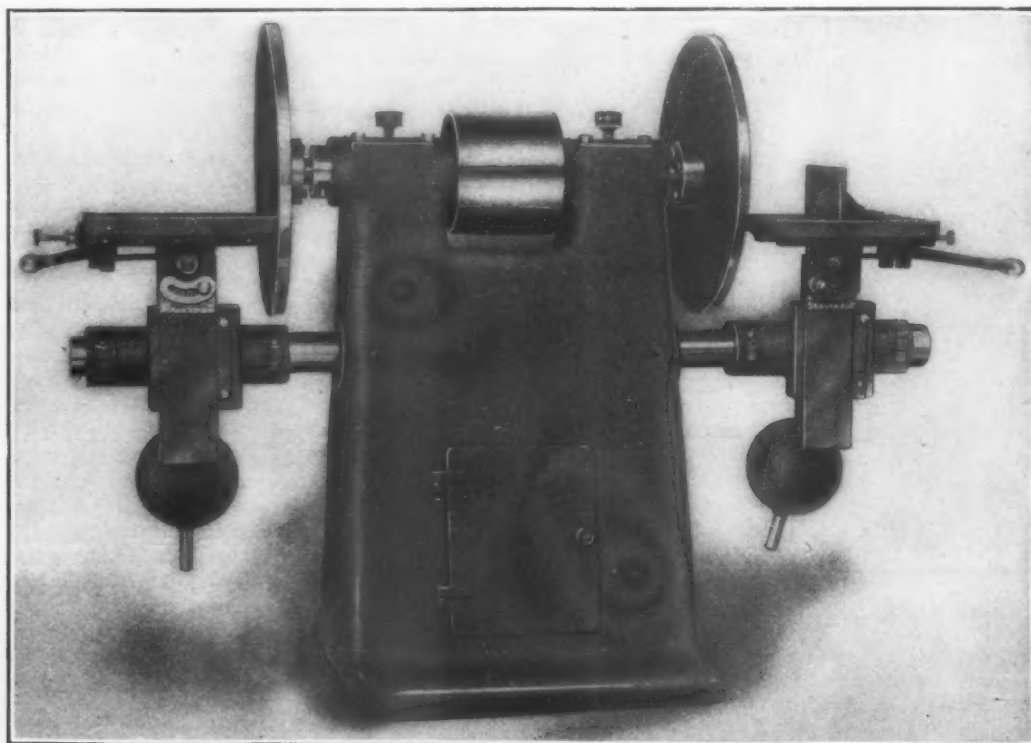


Fig. 1.—A New 27-In. Double Disk Grinder Built by the Ransom Mfg. Company, Oshkosh, Wis.

gear cases, exhaust manifolds, transmission gear covers, &c.

The features of especial interest in the disk grinder are its great belt power, derived from 251 sq. in. of belt contact surface per revolution over the arbor pulley; length and solidity of dust proof bearings; the provision of two lever feed tables and a convenient means of lining up the rocker shaft with the arbor. The crucible steel arbor, turned and ground and carrying two steel disks with a wide faced driving pulley located centrally between them, is mounted on the cast iron base. It runs in removable cast iron split adjustable bearings lubricated from compression grease cups. Hardened and ground tool steel collars $4\frac{1}{4}$ in. in diameter are provided to receive the end thrust, and lateral play is taken up by split clamping steel collars threaded to the arbor.

For the class of work for which the tool is designed lever feed tables are especially effective, and each of the disks of this machine is served by a table of this pattern; two operators are thus enabled to work on the same machine, which because of its ample belt power is able to carry the load. The tables are supported by a machinery steel rocker arm 3 in. in diameter, which is stiff enough to prevent the springing of the table away from the work. An important feature of the rocker arm is its adjustability which permits of its alignment with the arbor, thus insuring accuracy of the travel of the table across the face of the machine. The two tables are identical, except that they are, for the convenience of the operator, built right and left. They are of large size, each having three T slots, and are arranged to tilt to an angle of 45 degrees with the face of the disks. They are also adjustable vertically. The oscillating sleeves may be clamped rigidly to the arm and are held against lateral movement by split dust proof collars clamped to the shaft at each end of the sleeve.

retained, and the device though somewhat expensive is regarded by the maker as particularly effective.

Fig. 2 shows the clamp used for attaching grinding circles to the metal disks. It consists of a substantial hollow cast iron base with a screw pressed top. It is fitted with a vertical plunger which is raised and low-

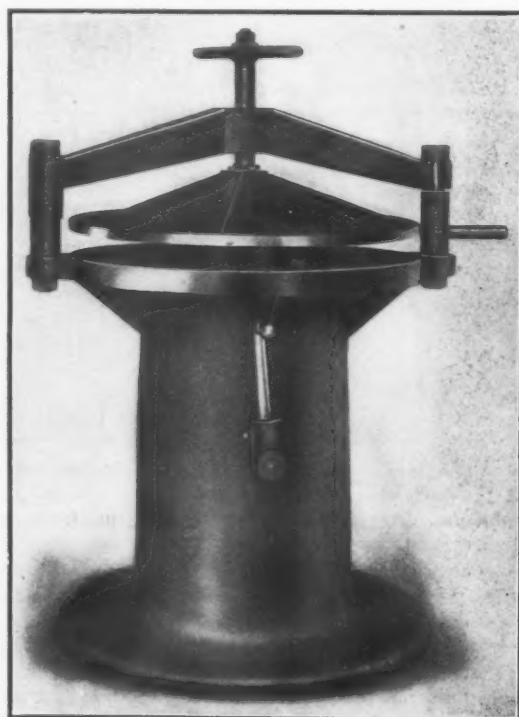
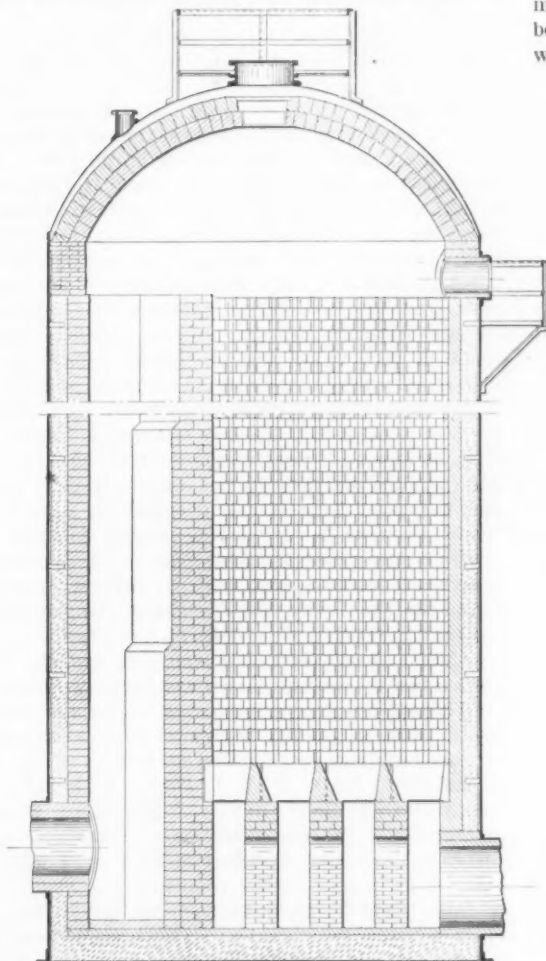


Fig. 2.—The New Ransom Disk Setting-Up Press.

ered through a hole in the middle of the clamp by a cam operated by the hand lever in front, as seen in the illustration. In setting up the disk the grinding circle is placed face down on the clamp and covered with cement, after which the plunger is raised and the centrally perforated metal disk is dropped over it. In this position the latter is guided with one hand and lowered with the other by use of the lever, thus bringing the metal disk central with the grinding circle. The advantage of this method over that of trying to drop a metal disk weighing 100 lb. or more on the cemented grinding circle and have it come central is quite obvious. The mistakes of miscalculation in such cases are not easily rectified, but by the means here adopted any inaccuracy that may occur can be corrected by raising the metal disk anywhere from 1-1000 in. to 2 in. as desired for the purpose of making an adjustment.

To remove the cemented disk the upper clamp is swung back out of the way, and by a half turn of the lever the operator is able to take hold of the disk with



The New Foote-Lamond Hot Blast Stove.

both hands and place it on the stud at the side of the clamp. The substitution of this method of handling for that of pushing the disk off sideways across the clamp overcomes the liability of getting cement on the face of the grinding circles and thus injuring their free cutting quality.

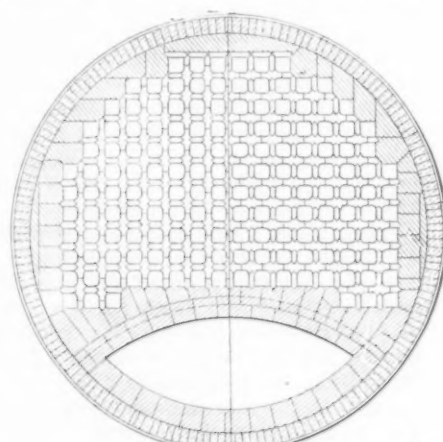
The principal dimensions of the tools are as follows: Disk grinder steel disks, 23 x $\frac{7}{8}$ in. or 27 x $\frac{7}{8}$ in.; bearings, $2\frac{1}{4}$ x 9 in.; arbor pulley, 10 in. in diameter, $8\frac{1}{2}$ in. face; tables, 10 x 14 in.; countershaft, tight and loose pulleys, 12 in. in diameter by $10\frac{1}{2}$ in. face, designed to run at 660 rev. per min. when 23-in. disks are used and 570 rev. per min. for 27-in. disks; base of machine, 36 x 28 in.; floor space, $3\frac{1}{2}$ x $6\frac{1}{2}$ ft.; clamp base, 26 in. in diameter; floor space for clamp, $3\frac{1}{2}$ x 4 ft. The weight of these tools complete and crated for domestic shipment is 3300 lb.

The rail rate on sheet steel, galvanized iron, &c., from Pittsburgh to Texas common points, has been reduced from 59 to 52 cents.

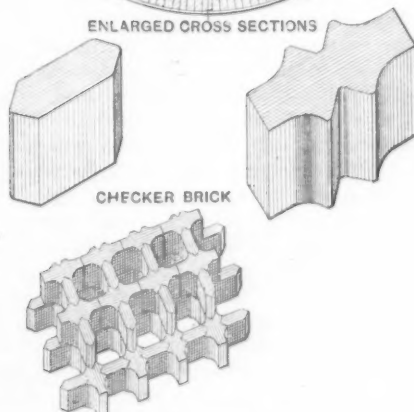
The New Foote-Lamond Hot Blast Stove.

A new type of checkerwork for hot blast stoves has recently been designed and patented by D. Lamond and is being introduced by D. Lamond & Son, Pittsburgh, Pa. The object of the invention is to provide checker brick which owing to their shape may be laid in such manner as to break joints and make an efficient bond. In the operation of hot blast stoves, as is well known, the brickwork is subjected to sudden and wide variations in temperature, and the resulting expansion and contraction are very hard on it, breaking it down unless it is bonded or otherwise held in a way that resists the destructive action. In the improved checker brick the essential element of strength has not been sacrificed.

As shown in the accompanying perspective view, the parallel rows of each course are arranged at right angles to the like rows immediately above and below, so that a perfect bond is obtained, together with a system of interlocking, making sure that the checkerwork remains intact should the combustion wall of the stove become burned through. The flues formed by these brick will remain perpendicular and dislodgment of brick,



ENLARGED CROSS SECTIONS



CHECKER BRICK

METHOD OF BONDING CHECKER BRICK

causing interference with cleaning, is prevented. The checkerwork is not tied into or bonded either with the main division wall between the regenerator and the combustion chamber or the ring wall, but is free to expand and contract independently of these walls.

Apart from the checkerwork in this new Foote-Lamond side combustion chamber stove, the stove brickwork is built practically after the pattern of the improved Foote stove, under patent granted to D. Lamond November 4, 1902. The main features of that patent were the forming of a complete arch of the combustion chamber wall, perfect bonding of the wall and the elimination of any ties in the ring wall, thereby insuring free expansion and contraction of the checkerwork. Many of these stoves have been built in the last eight years, giving high and uniform temperatures with a small amount of repairs. D. Lamond & Son build the two-pass stove with side and center combustion chambers, and are at present putting in a plant for the Iron-ton Iron Company, Iron-ton, Ohio, with the new style of checkerwork.

WELFARE WORK IN IRON MINING.*

Methods of the Cleveland-Cliffs, Colorado Fuel & Iron and Other Companies.

BY W. H. MOULTON.

The mining industry must be considered as having one paramount purpose, that of producing ore at the least possible cost and disposing of it at the highest price. Usually this is the only side of the industry that has been presented to the public or to its owners, but there seems to be another side that should command our attention. To the officers and stockholders the business must first appeal as a money making proposition. To the public it too often appears as the taking away of the treasures of a community without making adequate return.

In the early time of mining there was little thought given to anything but the physical aspects and to how the ores might be extracted and disposed of at the highest price, with no thought of lasting improvement, because the mine was considered to be always decreasing in value, while in a manufacturing enterprise the value of the business and property is always increasing, so long as it is a going concern. There was too little consideration for the man or his family. He was a factor in production and the main question was a sufficient supply of him to produce the required output.

There has now come, however, an understanding of conditions not only in the mining industry, but in all others, which has clearly indicated the necessity of studying man's relation to his family, to his neighbor, to his fellow workers and the business or occupation in which he is employed, and to the community in which he more widely lives. This is sociology.

We must study to learn of the man's relation to his work and find out if possible the responsibility that the employer has, not only to his employees, but to the public or to the community in which his business is established. It is not to find what you may do for the man's welfare, but to find what is necessary and wise in the newer extensive and intensive conditions of business. We can well assume that this is a duty which any business owes to the community in which its resources are developed. The man who is making the money for the enterprise is usually so occupied in this that he cannot study deeply into this personal side of it, and it is only by careful investigation and the trial of many things—not all, of course, meeting with success—that the desired result can be accomplished. The mining industry is not alone in the consideration of these problems; all others are meeting the same questions and increasing numbers are working for some solution. Across the water in the older countries the problem has come sooner and earlier work has been done upon it.

An Example in France.

In France the mining industry early saw the need of studying the relation of its men to its own success. The work done by a large number of mining companies has been very satisfactory and of the greatest value. At the coal mines of Blanzy, employing 8000 men and mining over 1,000,000 tons of coal per year, there has been a steadily increasing interest in the welfare of workmen. Since 1884 the company has built more than 1200 houses for its employees, selling land and houses to them at cost, and on long time payments for little more than the usual monthly rental, and in some cases for even less than the rental established by outside interests. A mutual aid society, to which the company contributes an amount equal to that paid in by the men, provides for regular payments during injury, also hospital service, medical attendance, medicines, nursing and attending of

the sick in their own homes. The company for many years has paid a retiring pension to old employees and a pension to the widows and orphans. It supports 15 primary and six infant schools for 6000 children. It also conducts evening schools and lends its encouragement to various athletic, educational, musical and other social organizations. The company has always stood for individual initiative and encourages independent action in the 20 or more organizations which it assists.

The Colorado Fuel & Iron Company's Work.

In our own country good progress is now being made. The Colorado Fuel & Iron Company has organized its sociological department with Dr. R. W. Corwin, chief of its hospital staff, in charge, and has given the most careful consideration to the welfare features of its business in connection with the life of its men. With Dr. Corwin are associated Dr. Walter Morrill as superintendent; Margaret G. Grabill, superintendent of kindergarten and domestic science; Dwight W. Baker, superintendent of the Colorado Fuel & Iron Company Normal and Industrial School; Mrs. Mary Small, matron, and 12 kindergarten teachers. At eight different mining locations are located club houses, with social halls at two other smaller places. They have tried operating their new club at Calcite without selling liquor, and their report says: "No liquors are sold and in fact none are to be had in camp. There are likewise no 'speakeasies' or 'blind pigs,' and the men are satisfied and no time is lost after pay days because of drunkenness. This is one instance at least where the liquor problem is being successfully handled and all credit is due to the superintendent at that place." This is a small location and does not present the difficulties found in the larger places where the substitution of something for the saloon is at the very least a great problem and as yet not solved. According to its last report the following plans have been in effect:

The old hospital buildings at Pueblo as a social center for the community serves as a home for 50 people. In this building are held the night school, Young Men's Social Club, the C. F. & I. Junior Club for Boys, the Penny Savings Bank, library, Tennis Club, Junior Roycrofters, and the many socials, lectures and entertainments. Their new hospital located at Pueblo is considered the finest in the country.

All "drys" are furnished by the company with shower baths, individual wash basins and lockers. Lectures and entertainments are frequently given and dances held. Night schools have been conducted in several of the camps with some degree of success. Women's clubs in various camps have become strong allies of the kindergarten teachers and social workers. Libraries are maintained and kindergartens at all locations where not provided by the public schools.

Surgeons give practical talks to the older scholars of the schools. Penny savings funds are encouraged. Lessons in domestic economy are given in connection with housekeeping and sewing classes. Boys' clubs are organized and picnics held. Much attention has been paid by Dr. Corwin to the building of schoolhouses, and he has developed his plan of single story buildings on the pavilion system, which has much merit, especially in a climate where the weather conditions are not too severe. The following summary in Dr. Corwin's report is a concise statement of the things that make for success in his work:

Improvements that have been made and that are anticipated depend for their success largely upon local co-operation and enthusiasm. The local leaders and officials in any camp can influence social conditions for good or bad as they desire, hence the

* A paper read at the meeting of the Lake Superior Mining Institute, Ishpeming, Mich., August 26, 1909. Mr. Moulton is secretary of the Sociological Department of the Cleveland-Cliffs Iron Company.

necessity for cordial co-operation of all company officials as well as employees in the work of this department. If all unite in an uplift movement, welfare work is simple, but if indifference exists or worse, no desire to improve, their social betterment is not only discouraged but becomes impossible. People who help themselves will always be helped. This cannot be too strongly impressed upon any community.

The sociological side of the industry presents to us the following important matters for consideration, among the great variety incident to different conditions, and of which our time will permit of only the briefest mention.

Foreign Population in Mining Towns.

The foreign non-English speaking population of our mining communities is rapidly increasing. The question of assimilating these large additions is of vital moment. As we accept them as our employees, we must in some measure accept a degree of responsibility for them. From figures prepared by Dr. Peter Roberts we obtain the following data:

The Upper Peninsula of Michigan comprises about 25 per cent. of the land area of the State and 11 per cent. of the male white population. This population is composed as follows:

	Per cent.
Native born of native parentage.....	12.3
Native born of foreign parentage.....	40.5
Foreign born.....	47.2

Of the total white population of foreign parentage in the State the lower peninsula has 53.7 per cent.; the Upper Peninsula has 46.3 per cent. The Upper Peninsula contains 11.5 per cent. of the total male white population, but it has 46.3 per cent. of the total male white population having foreign parentage. As Dr. Roberts says, the foreign problem in the State concerns the Upper Peninsula more than any other part of the commonwealth, and if Michigan is to do its part in solving this problem it will largely be accomplished in that part of the State and by the people residing there.

The problem in Michigan has its counterpart in Wisconsin and Minnesota, as in all other mining States. Have we not a duty in this work and toward these people? It would seem that we must of necessity for self-preservation, if not for motives of friendly interest, do all that we can to bring to these people the teachings of our Government, regard for law and order and a spirit of respect for our institutions. It is becoming more and more a problem, and it is only by the most careful study and experiment that it can be properly met. As Dr. Roberts says, "It is not likely that the State as a whole will give this matter the attention it deserves. The way must first be blazed by private enterprise."

The Mining Companies and Education.

One of the first things undoubtedly is the matter of education. The mining companies have always stood for good schools and have been very generous in the matter of taxation for school purposes and the amount of money expended for buildings, equipment and salaries. We too often are perfectly willing to let it go at that and think we have no further consideration or responsibility. We should at least keep in touch with our school system and see that the work done is such as is demanded in the locations where we reside. While the course of study should be as uniform as possible in the State, and the superintendents of public instruction are in the best possible position to study the requirements and plan for methods and courses of study that will give the best results, we should watch the work so zealously that fine spun theories may not be carried out at the expense of the practical education of the pupils. Fifty per cent. of the boys in our schools drop out before they are 16 years old, and it is necessary that the school work up to that age be the best possible for their use. We should see that the attention given to the higher grades in our public schools should not detract from the value of the work done in the lower grades in which the majority of our boys receive all the education given them by the public schools, and that the school teachings be so presented that our young men may consider it worth while to look for their future work in our mines.

Employees' Clubs.

In addition to the matter of education of the children, the social life of the community has a great deal to do in establishing the kind of citizenship to which these men look forward. The mining companies should take active interest in community problems and lend their aid to plans for the betterment of conditions. There are various agencies that can be called upon to assist in such work. Club houses such as have been erected for the men at Pulatka, Mich., by Pickands, Mather & Co., and at Mountain Iron, Mich., by the Oliver Iron Mining Company, are of very great value. They give a meeting place for the men, with bowling alleys, billiard and pool tables, smoking rooms, game rooms, baths, place for club meetings, musical and other entertainments, dances and social gatherings of all kinds.

Clubs established by the men have been productive of much good. Such organizations as the Oliver Club and the Cleveland-Cliffs Club, both in Ishpeming, are sure to be a benefit to any business. These clubs have bowling alleys, billiard or pool tables and recreation rooms. A monthly meeting is held, usually with supper, for the discussion of topics of interest, addresses by outside speakers or entertainments for the members. These clubs usually have an outing in the summer. Mining clubs have also been organized which have for their membership the mining captains, shift bosses, timber bosses, the superintendents and the heads of departments, either as active or honorary members. Monthly meetings are held from October to June, at which addresses of interest are given, often with the aid of the stereopticon. Lunch or supper is served and topics relating to the mining work discussed. The superintendents also have a club, meeting from time to time, at which the problems of mining are discussed, committees of investigation appointed and their recommendations acted upon at these meetings, are put in force. These club meetings are very beneficial not only in the introduction of new plans and methods but also in the social fellowship promoted among the members.

Young Men's Christian Associations.

Taking everything into consideration, there is probably no agency better fitted for handling the work in connection with the men at our mining locations than the Young Men's Christian Association. The Pennsylvania Railroad Company has approved of the Y. M. C. A. as an established policy of the company and is contributing to the support of over 35 associations on the lines of its roads, in addition to having provided the majority of the buildings. The following statement of the late President Cassatt, referred to in an address by Max Rieberneck, comptroller of the Pennsylvania Railroad Company, shows the estimate put upon it by the officers of the company in connection with their railroad work:

"I am in full sympathy and accord with the work which is being so successfully carried on by the Young Men's Christian Association. I am satisfied that excellent results, from the standpoint of the employees as well as of the company, are being accomplished through this agency."

In the anthracite and bituminous regions of Pennsylvania great progress has been made in Y. M. C. A. work. Some 30 buildings or more in this region, many of them in small locations, are now in use. From these workers reach other camps where buildings are not yet located and the plans are thus extended. Mining institute meetings are held each year in different buildings and a variety of topics pertaining to all features of mining are discussed by the best posted engineers and mining men, not only from that section but elsewhere.

Y. M. C. A. Work on the Marquette Range.

Through the generosity of the Cleveland-Cliffs Iron Company, the Oliver Iron Company and the Lake Argeline Company in assisting the local people a Y. M. C. A. has been established at Ishpeming. This building is thoroughly equipped for the use of the men, with bowling alleys, swimming pool, shower baths, locker

rooms, reading room and library, gymnasium and lecture room, and one floor of dormitory rooms for members. It was opened June 1, 1909, and the work during the coming season will include clubs of all kinds for every group of men who may wish to study or pursue some plan of recreation or mutual benefit. Entertainments and lectures will be given, and the building will be used for social activities of every description. Educational classes of various kinds will be conducted, giving non-English speaking men a chance to first learn our language and become acquainted with the standards of our citizenship and grow into our city life under the best conditions. It has always been found that the men are anxious to avail themselves of every opportunity of bettering their condition and will spend much effort in this direction. All such agencies should be systematically encouraged. If the broad Y. M. C. A. plans should be introduced in all of the various mining localities, even with buildings with small accommodations, much might be done in solving the problem of how to assimilate the large numbers of men coming to our communities unacquainted with our customs, habits of living and ideals of government. I cannot too highly commend to the members of the Lake Superior Mining Institute the value of the Y. M. C. A. in its effect on local affairs and conditions.

The Cleveland-Cliffs Iron Company has begun the erection of a building for Y. M. C. A. and club purposes at its new mining town at Gwinn, Mich. In addition to the features usually planned for in the various clubs and Y. M. C. A.'s, careful attention will be given in the matter of neighborhood clubs for various groups of women, and educational and entertaining features for them and for the boys and girls of the community. This building will be the recreation center for town and be the leading factor in all social and educational development and improvement activities. The mining companies can, I believe, well afford to contribute largely to such efforts. Individual initiative should be encouraged in this work, the company through its different men supplementing and assisting in the direction and execution of the plans.

Sanitary Conditions and Medical Service.

The sanitary conditions of the mines demand a most careful consideration. It was only a few years ago that any old place was sufficiently good for the men to change to their mine clothing, and for their clothing for street wear to be taken care of while they were underground. Every facility has now been given to provide the men with the best accommodations in change houses or dries. No one would think of building a dry without the best of washing facilities, with hot and cold water, shower baths, lockers for the care of the clothing and a good system of ventilation. In the use of water closets, in many cases, some education is necessary, but anything that can be done to improve the sanitary conditions underground is of value to the men and in actual production through the possibility of securing the best of labor.

The health of the community is of the most vital consideration. The greater number of our mining locations are well provided with physicians, the peers of any in their education, ability and character of professional service. Every large mining town or city has its hospital with suitable equipment. The kind of buildings more recently erected, such as that at Coleraine, Minn., and Ironwood and Gwinn, Mich., indicates appreciation of the importance of providing the best facilities for the handling of cases which are the results of the hazard of the business. The payment of \$1 a month by the men employed should guarantee suitable equipment, competent physicians, efficient nurses and good medicine. The hospitals that have inefficient men, lack of proper nursing or a greater regard for the income received than the service rendered are few and cannot be too severely condemned.

Visiting Nurse.

For over a year the Cleveland-Cliffs Iron Company has employed a visiting nurse for the benefit of the families of all employees. The nurse works under the

direction of the physicians of the hospital, visiting and assisting in families to whom her services can be of benefit. This work is not given as a charity, but as the means of assistance in cases not only of serious need, but in advice and usefulness in the home as occasion might require. The nurse has often been of material assistance in cases of emergency before a regular nurse could be obtained. She is not doing the work of the physicians, but is supplementing their efforts, seeing that their directions are carried out and families instructed in the care of the sick as well as in the general subject of the improvement of hygienic conditions. She can actually demonstrate how the work should be done. The saving of a child's life in several cases and the restoring to active life of a wife and mother who had been in bed eight months, with every probability of remaining so as long as she lived, not to mention various other cases in which valuable assistance as well as sympathy have been given, are sufficient to repay the company many times for the cost of this work. I would consider that of the various features coming under my attention in this improvement work that of the visiting nurse shows the greatest direct benefit and value.

In her work the nurse has found the mothers in many homes who, through the work occasioned by large families and household cares, have never had an opportunity for rest or recreation. A comfortable house was secured during the last two seasons and many mothers were taken for an outing for from one to two weeks. Sometimes they went alone and again took the younger child or baby of the family with them. Meals were provided, so that they had no work to do other than they might wish to occupy themselves with, and many a mother has gone back to her family refreshed in body and in spirit. The cost is not very heavy, but the benefits are large, and the women have been glad to take advantage of this opportunity of securing a little relaxation from the monotony of their daily lives. In a number of instances it has really been the first vacation that has ever come into the life of the mother of a large family. It has in some cases warded off approaching sickness occasioned by overstrain in household cares.

Prevention of Accidents.

It is so well known that the mining industry is one of danger that we consider too little the accidents occurring so frequently in all mines. These accidents should demand a most careful study not only for the reduction in economic loss and the added cost of production, but because of the effect upon the men employed. We must recognize that it is a dangerous occupation, and accidents will occur and cannot always be avoided; but it should be a part of the duty of the companies to study the causes and results of these accidents carefully in each case in order to provide such remedies as may be possible. In looking over the equipment and machinery of the present day and comparing it with that of 25 years ago, it will be seen that additional care is being exercised, this care being of great value to the men as well as to the company economically. We see improved devices for hoisting and lowering the men, with various appliances to guard against accident. We find automatic closing gates at shaft openings and a better and uniform system of signals. We find our mines better ventilated and with better methods of fire protection. The mine surroundings, from being a scrap heap, have become an orderly place of work with supplies properly stored. Special commendation should be given to the United States Steel Corporation for the study it has given to promote the safety of its employees.

In the coal mining regions of Pennsylvania much attention has been paid to the first aid to the injured. Regular courses of study have been pursued and men instructed in their duties in times of accidents. Exhibitions have been given and contests held, showing the proficiency attained in this work, which has the greatest value. Our different mines can well afford to promote some definite plan for first aid and provide proper equipment and facilities.

Benefits Funds.

Practically all the mining companies in our section contribute equally with the men to the benefit funds from which the men receive a monthly payment up to one year in case of injury, while in the event of a fatal accident sums from \$200 to \$500 are paid to the family or administrator. In Ishpeming alone \$10,158.58 was paid in 1908 for accident and death benefits. It is of the greatest value to the men to be assured of some degree of care or assistance during period of injury, and the administration of these funds can well be studied to see if further improvement in benefits and assistance cannot be made.

In this connection I would mention the administration of the Carnegie Fund through the Steel Corporation, which has been of very great helpfulness in the many localities in which its operations are conducted and which is so well known as to need no extended description.

In the matter of benefit payments in case of injury there has been no great degree of uniformity in the practice of the different companies. It must come more and more to be recognized that these injuries are a hazard of the business and that the business should stand the reasonable cost of every one on the same basis, in which event it would not be a hardship to any or carry suggestion of unfair comparisons.

Pension Systems.

As a further aid to the men and their families pension systems such as have been established by the Calumet & Hecla Mining Company and the Cleveland-Cliffs Iron Company are of very great benefit. A man who has worked for a very long period of years, devoting in many cases the best of his life to the service of the company, can well have such services recognized by some payment during his declining years. After a very careful study of the pension system in use across the water and by various companies in the United States, the Cleveland-Cliffs Iron Company adopted a pension system taking effect January 1, 1909. At that time the Board of Directors made the following statement:

The object of this system is to recognize the value of long continued and faithful service and to in some measure provide for those whose years of activity have been expended in the service of the company and who through age, injury or infirmity have become incapacitated for further labor in connection with our work.

The system provides that any employee who has attained the age of 65 years or more and has been in the employ of the company for 25 years, may on his own request be retired and pensioned. Any employee who has worked for the company for 25 years and is 60 years of age may be retired by the Pension Board if in their opinion his injury or infirmity may make it desirable to assist him in this way. This pension does not prevent the men from securing any other employment which is not prejudicial to the interests of the company and of which their condition will permit. The monthly allowance of payment is on the following basis and is continued through the life of the beneficiary:

For each year of service 1 per cent. of the average monthly pay for the 10 years next preceding retirement is to be paid to them monthly. The minimum pension to be paid is \$15 per month, so that in case the amount computed upon the above plan should be less than \$15 this monthly payment is increased up to the minimum amount stated. As a further means of benefit to the men and guarantee to them that their families are not to suffer privation from loss occasioned by their death, the pension system provides certain payments to the widows and orphans. To the widow of a man accidentally killed at work, a pension is paid of \$12 per month for a period of five years, and for each child under the age of 16 years, \$1 per month additional. In case the children are all under the age of 10 years when the accidental death occurs, payments may be continued longer than five years or until such time as the widow remarries or the family through the aid of mother or assistance of the children becomes self-supporting. The object of this is to provide the family with some assistance up to the time that the members become of such age as to render further

support unnecessary. This payment, in addition to the amount received through the benefit fund in case of death, is usually sufficient to provide the family with some degree of comfort and insure against serious hardships.

The company is sure that these payments are of great benefit and, while not lessening a man's disposition to provide for his family, leads him to feel that the dangers incident to mining are not such as make his family entirely dependent upon charity in case of his accidental death. These benefits are to be paid for the care of those needing them and are not liable to attachment, levy or seizure under any process whatever.

Improved Surroundings.

The mining companies can do much to promote the sanitary conditions of the town. A proper regard for the surroundings of the mines, a prompt disposal of waste and co-operation with the health authorities will serve to lead the people into like habits. The character of the home and the home surroundings has great effect upon the life of the people and the efforts in this connection are to be much commended. At Ishpeming for 15 years the prizes offered by one of the mining companies for best kept premises, vegetable gardens, vine planting, &c., have been of the greatest value in producing a mining city the character of whose homes cannot be surpassed.

We say that the men make the character of the town in which they live. We are also convinced that the character of the town in which a man lives has a great deal to do in molding him. There is no question about the value of building towns in such a way as at Coleraine, Minn.; Gary, Ind., and the new town at Gwinn, Mich., in which features of benefit to its citizens have been carefully considered. At Gwinn, the town has been laid out under the direction of Warren H. Manning, the eminent landscape designer, who has provided for the retaining of all the natural beauties that were possible. The land was cleared under the directions of Mr. Manning and his engineers, so that all trees of value should be saved and all roads and streets located and graded under his supervision. First of all a water works system was put in and at the same time a complete system of sewers, so that these were available previous to the erection and occupation of the houses. As the result of this plan of work, town building has continued over three years without a single case of typhoid fever, which is usually so very prevalent in new towns. Coincident with the building of the town, a hospital was established for which benefit and medical services the men pay the \$1 per month customary at all the mining locations. Houses have been built and sold on reasonable terms and long time payments.

Organization of Welfare Work.

It is essential to the greatest success that a proper amount of time be given to the study of the different problems, and this can best be done by a suitable organization, such as has been effected in the Colorado Fuel & Iron Company or that introduced by Wm. G. Mather as a part of the work of the Cleveland-Cliffs Iron Company. This organization serves as a clearing house for problems of a sociological character that may arise in connection with the business.

There should be no thought of paternalism in the effort to surround the men with such environment as to make for their best welfare; but they should be encouraged to do what they can for their own improvement and benefit, the companies lending their help, co-operation and assistance so far as practicable. I know of no one question connected with the mining industry that will pay better from every standpoint than the study of the sociological conditions.

The plant of the Capital Lock Nut & Washer Company, Columbus, Ohio, including buildings, machinery and real estate, will be offered for sale at public auction October 16 by the receiver Charles P. Outhwaite. The entire property is appraised at \$70,015, and is to be sold at not less than \$42,000.

The Rasmus Electric Hoist.

A 5-ton electric hoist requiring only 35 $\frac{3}{4}$ in. of head-room and weighing only 500 lb. is somewhat unusual. The construction making such a hoist possible, as adopted by Gustav Rasmus, 514 West Fifty-seventh street, New York City, is also unique. The motor is contained in the hoist drum, or, more strictly speaking, the drum is the motor frame and supports the field poles and coils. The

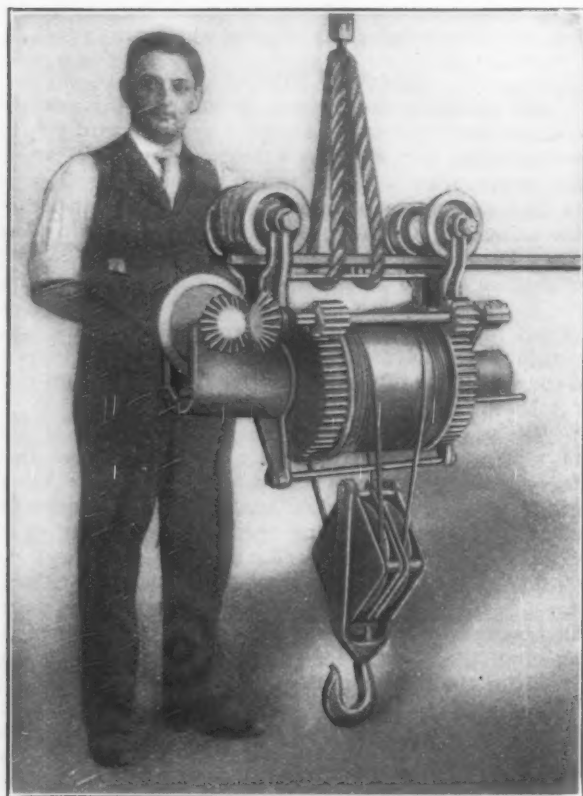


Fig. 1.—A New Electric Hoist Built by Gustav Rasmus, New York City.

parts of the hoist are few and simple, as a consequence of which the hoist costs little to manufacture and can be sold at a very moderate price. The parts of a standard motor are used in the construction, the armature, field coils, commutator and brushes being purchased from an electrical manufacturer and assembled in the drum. The two drum gears at the ends take the place of the end shields of an inclosed motor.

The mechanical advantage of placing the armature within the drum, in addition to that of reducing the number of parts, is that a number of castings and braces are done away with which are ordinarily necessary to hold the motor in alignment with the gears and the drum. This saves a considerable weight of iron and steel, the cost of that material and the extra labor. To

reduce friction the armature and the drum rotate in the same direction. The hubs of the driving gears are the bearings of the armature shaft. The drive from the armature shaft being through a worm and worm wheel, load and speed brakes are not required. The motor is electrically controlled for speed, and when the motor is at rest, the current being cut off, the gears are locked in position by the worm, which prevents the load from running down.

In Fig. 1 the hoist is shown with all gear covers removed and suspended with a bar representing the lower flange of an I-beam, the hook block up as close to the drum as it will go and the hook resting on the floor. As compared with the height of the inventor standing beside it, the small size of the hoist and the small head room it requires are strikingly brought out. Fig. 2, which gives side sectional and end elevations, clearly brings out the construction of the hoist. The hoist is supported by four flanged wheels mounted on slightly inclined studs in the suspending yokes, so that cylindrical tread wheels may be used, and have full bearing contact on the upper faces of the lower flange of an I-beam. The hubs of the drum gears are journaled in the hoist frame and through their hollow trunnions extends the armature shaft of the motor. The commutator and controlling apparatus are located at one end and on the opposite end of the extended armature shaft is a worm engaging a worm wheel which, through bevel gears, drives a shaft parallel to and above the armature shaft. This shaft carries pinions meshing the drum gears. Tracing through the gear connections, it will be seen that the armature and the motor and the drum revolve in the same direction, which has the effect of increasing the speed of hoisting and reducing slightly the friction between the armature shaft and its bearings in the drum gears. The motor is of bipolar type and the coils and pole pieces for the two poles are secured at diametrically opposite points in the interior of the drum.

As the field of the motor revolves it is necessary to provide contact rings to connect the field coil leads with the source of current. A limit switch is provided to cut off the current when the hook reaches the top of its travel. No limit switch is needed for the lowering movement, for if by any chance the hoist should be left running the rope would simply wind around the drum in the opposite direction and again lift the hook, when the limit switch would cut off the current. Since the worm and worm wheel form part of the power transmission, there is no need of providing a brake. The load cannot run down when the motor is at rest; the motor must be operated to allow the load to descend.

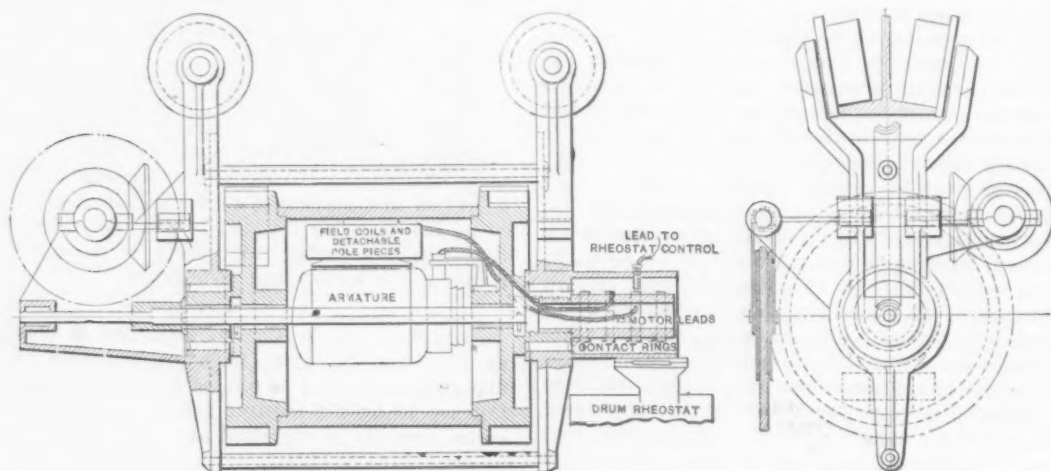


Fig. 2.—Side, Sectional and End Elevations of the Rasmus Electric Hoist.

The new plant of the Virginia Bridge & Iron Company, at Memphis, Tenn., has been completed, and was recently started up. The works include several substantial buildings located on a site covering an area of 6 acres at Union Belt Line and Breedlove avenue. This is a branch plant, the parent company being located at Roanoke, Va.

The Philadelphia Foundrymen's Association.

The regular monthly meeting of the Philadelphia Foundrymen's Association was held at the Manufacturers' Club on the evening of October 6, with a good attendance. Representatives of out of town foundries were especially numerous. In the unavoidable absence of the president Dr. Elmer E. Brown occupied the chair. An application for membership from S. G. Krake, Brooklyn, N. Y., representing the Gardner Publishing Company, Cleveland, Ohio, publisher of *Castings*, was favorably acted upon and other routine business transacted.

The paper presented for the evening's discussion was on "Jolt Ramming Molding Machines and Foundry Methods Involved," by E. H. Mumford of the E. H. Mumford Company, Philadelphia, manufacturer of foundry molding machines. The greater part of this paper is herewith presented:

Jolt-Ramming Molding Machines and Foundry Methods Involved.

It is, in fact, chiefly creditable to the individual molder, often represented by the foreman or foundry superintendent, that the real development of machine molding is due, rather than to the designer and builder of the machine. By his interest and intelligence the working foundryman has carried this development, especially as applied to what are known as jolt or jar ramming machines, far beyond what was anticipated in the early days of their manufacture.

It is now all of 20 years since jolt-ramming machines, then cam-lifted and dropped on a rigid anvil operating on a small type flask, were used exclusively for ramming such work as wagon axle boxes and pipe balls. Gradually the application of pneumatic lifting plungers broadened out through the application of the method to larger and larger work, until to-day we have pneumatic jolt-ramming machines in successful service with lifting capacities from 10 to 15 tons, and tables 6 ft. by 9 ft., or even larger.

The method of ramming sand in jolt-ramming operations is of the same effect as the old method of squeezing or press ramming of which the separate particles of silica or quartz, more or less thoroughly coated with the bonding element of aluminum or clay, are dropped into closer compact amounting to a compression of 25 to 50 per cent, in volume, and through their closer association are stuck together by their clay jackets, thus constituting a more or less firmer body of rammed sand. Sand has been rammed by impact even before it was rammed by pressure. In the throwing of sand into the deep pockets a grate bar was used long years before molding machines were, and later we have had what are known as gravity machines, which drop compacted bats of green sand from an elevation, which in falling amalgamated with the sand already fallen to form a rammed mold.

The various processes of securing impact between the particles of green sand and so ramming them are, in fact, embodied in the jolt-ramming operation with this advantage, that the sand which is to be rammed is placed in proper position, with the facing next to the pattern, gagged and secured as desired, and, with the flask full, and with evenly distributed pressure, is then rammed by impact of the separate particle, upon one another through the succeeding blows of the machine table upon its anvil with the mold upon it. The action is not a uniform or a simultaneous one, but rather a progressive one, and it should be realized that one law applies in relation to all jolting machines, namely, that the effect of the impact as felt at the table of the machine varies directly as the height and inversely as the depression of the anvil under the blow.

This amount of compacting force represents the limit that can be secured with any given machine, and as every part of the horizontal pattern or joint surface shares this principle, it is probable that the first layers of sand, immediately in compact with these surfaces, are rammed to a maximum hardness at the very first blow. What is true of the machine under the depression of the anvil at each blow is true of each grain or layer of sand as it comes to rest on the sand below it, and the sand in the upper regions of the mold—that is, where it is most remote from the pattern or joint surfaces—is but little rammed by the first impact, but gradually hardens in the lower strata and builds back on the upper layers of the sand until the entire mold is sufficiently rammed. The amount of lateral dispersion, such as will allow the sand to adhere to the sides of the flasks and bars slightly tapering, varies with the quality of the sand, and it is noticeable that sand as used for deep sand holes for steel castings acts better in this way by reason of its lesser friction among its particles, so that its movements down the sides of bars and flasks and into undercuts are better than ordinary green sand. It is preferable to use bars of such a shape that the sand will flow of its own accord in its advance down the sides of the bars without leaving them, so that when the mold is rammed the

sand, which has run down the sides of the wedge-shaped bar, will be found compacted under their relative sharp edges and still adhering to their sides.

It will be evident from the consideration of the above-named conditions, involving stability and firmness of surfaces, that vibration of all surfaces is to be avoided, and it is this vibration of flasks, bars, stripping plates and patterns which more than anything else has militated against the use of the well-known types of hand-rammed stripping plate machines upon the tables of jolt-ramming machines.

TIME ELIMINATED AS AN ELEMENT.

Jolt-ramming machines practically eliminate the operation of ramming as a time element. Even the heaviest molds placed upon it are completely and almost perfectly rammed, when, as in this case, an expensive operation has been reduced to a matter of no importance; other operations which the machine does not perform rise its unusual prominence, and it is becoming a problem how best to take advantage of the greater economies of jolt-ramming machines, in view of the fact that it is almost impracticable with existing foundry appliances to transport the molds to and from the machines and finish them on the floor fast enough to make complete use of the machine.

The traveling crane is an ideal instrument for the transportation of these molds, lifting them slightly and lowering them slightly to be sure, but in the main carrying them from place to place rapidly and effectively. However, if the traveling crane is sent on too many errands and is made to do the work of transportation which could as well be performed by a surface car, it is soon discovered that its proper function of lifting and lowering is sacrificed to getting it hither and thither over the foundry floor, often interfering with other cranes on the same runway.

My main purpose in addressing you this evening is to get some more minds at the problem of how to adapt our foundry methods to this new principle of jolt-ramming green sand molds, and I make this suggestion, which seems to me the best way to reduce crane service and facilitate what is mainly transportation, so getting the best results from jolt ramming. Assume that the machine is stationed at a point on a longitudinal foundry track, upon which a number of cars which can pass at turntables or otherwise are operated. Locate this track at one side of the heavy work floor. Imbed rails at suitable intervals in the floor, running at right angles to the longitudinal track and upon the platform of a car running on this track, and, serving as a transfer car, fix tracks running across the bottom, flush with and in the same direction as those running athwart the shop. The molds would then be set upon secondary cars on these tracks for ramming at any desired point on the floor, and then moved across to the transfer car and by it carried to a jib crane serving the molding machine, by which the prepared mold is set upon the table of the machine. In a few seconds it is rammed and is immediately set upon the car which brought it. It is then returned over the route it traveled before to its original station on the floor. In this way large molds may be rammed on a machine at one station and stored preparatory to pouring on the main floor of the foundry, much as trolley cars are stored by transfer tables in our car barns.

The problem of handling large volumes of heavy sand and flasks to and from jolt-ramming machines, which are necessarily stationary, can be solved, it seems to me, in no better way than the above. There is no cheaper way to handle the sand to form a mold than the mold itself, given proper facilities.

Discussion was rather limited, owing to the fact that those present were to a large extent unfamiliar with the type of machine, but a number expressed themselves as favorably impressed with its possibilities. Wilfred Lewis of the Tabor Mfg. Company made a few remarks, which coincided largely with Mr. Mumford's views as to the possibilities and limitations of the jolt ramming type of molding machine.

The Lake Superior Corporation held its annual meeting at Camden, N. J., October 6. Charles D. Warren, president, handed in his resignation, and T. J. Drummond, of Montreal, was elected in his stead. Thomas Gibson, of Toronto, was chosen secretary and treasurer in place of Walter P. Faust. The other officers elected were J. Tatnall Lea, Philadelphia, first vice-president; Walter K. Whigham, London, second vice-president; J. Frater Taylor, third vice-president. These directors were re-elected: T. J. Drummond, J. Tatnall Lea, W. K. Whigham, J. Frater Taylor, R. L. Austin, Herbert Coppel, J. S. Dale, J. Terry, Jr., L. N. Lovell, F. M. Cowen, H. N. Price and Charles D. Warren. Mr. Warren gave out a statement that he had asked to be relieved of the office, which he had held for five years, so that he could devote himself to his private affairs.

THE IRON AGE

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Remarkable Swings in Pig Iron Output.

So far as pig iron production is a gauge, 1909 will be a far more important year than even the most sanguine predictions of three months ago allowed. Roundly, making the comparison with 1907, the year of high tide in iron and steel, 1908 was a 60 per cent. year. It was conceded at its beginning that 1909 would in all likelihood advance to 80 per cent. of the 1907 record. In the summer months this estimate was raised to 90 per cent. The astonishing figures made last week from the reports of the blast furnace companies to *The Iron Age* indicate that if the rate of production on October 1 is maintained through the year, 1909 will show a pig iron output 98 per cent. of the record total of 1907.

The contrast between the first and second halves of this year and between the second half of the year and either half of 1908, particularly the first half of that year, appears in the following table:

Pig Iron Production in 1907, 1908 and 1909.			
First half.....	13,478,044	6,918,004	11,022,346
Second half.....	12,303,317	9,018,014	*14,261,000
Totals.....	25,781,361	15,936,018	25,283,346

* Estimated.

The estimate for the second half of 1909 is based on our statistics for coke and anthracite pig iron production in the third quarter of the year, a calculation for the fourth quarter on the assumption that the weekly rate of 564,885 tons reported October 1 continues through the year, and an estimate of 30,000 tons a month as the output of charcoal pig iron. Whatever the exact production of pig iron for the second half of 1909 may prove to be, it is evident that the difference between the first and second six months' periods will be greater than has ever been known in any calendar year in the history of the industry. Much more startling, however, was the difference between the second half of 1907 and the first half of 1908, this being nearly 5,400,000 tons. The recovery from the low rate of the first half of last year has been noteworthy—a step of 2,100,000 tons in the second half of 1908, another of about 2,000,000 tons in the first half of this year, and a third of, say, 3,250,000 tons in the second half. Thus an increase of, roundly, 7,350,000 tons makes the probable record for the last half of 1909 more than twice that for the first half of 1908. Such tremendous swings, and at such a pace, from low to high, are without parallel in the iron industry of any other country. Further, it is most remarkable that in an era of concentration in the American iron trade—a time in which the influence of powerful consolidations has been

considered as making for stability in prices and evenness in demand—there should be fluctuations in consumption more violent than were ever recorded. At the same time the range of prices, though not the widest for a like period, has been such as to suggest that the iron industry in the United States has not gone so far in unlearning its old ways as we are sometimes asked to believe.

The Outlook for Copper.

Copper has been under a cloud for so long a time that the trade is in some danger of regarding the present price level as one which is normal and is destined to persist for a long time to come. Production in this country has been at a tremendous rate during the greater part of this year, and a further moderate and gradual increase is expected, as new mines swing into line and the increased capacity of some of the older companies comes into play.

All hope of any co-operation among producers to restrict output has been abandoned, all stock exchange rumors to the contrary notwithstanding. The supply therefore promises to be ample; in fact, there is some feeling of discouragement that the returns of the Copper Producers' Association for September show a further addition to the surplus. In itself, the stock of marketable copper of all kinds at all points in the United States, amounting as it does to 151,472,772 pounds, or roughly to two months' deliveries, is not a formidable quantity. The serious feature has been the uncertainty as to what amount of copper is really being carried abroad. That it was exceedingly large at one time was generally accepted as a fact by the trade, in spite of the vigorous and persistent denials of interested parties. Now estimates of what it was are cropping up, chiefly in order to point the claim that there has been a sharp reduction in recent months. There is little that is convincing in the whole array of exact statistics, in the absence of satisfactory data as to the true condition of the European stocks, and the trade must be guided largely by general considerations.

Among these the most convincing and striking fact is the wonderful development of the iron industry in this country. It reflects a recuperative power and a scale of current consumption, even taking into account all facts bearing on the restocking movement, that must tell before long in the copper industry which is so closely allied to it industrially. At the present level of copper prices, it looks like an act of common prudence for consumers to increase their reserves and to begin cautiously to anticipate their requirements.

Advancing Machine Tool Prices by Monthly Steps.

A well-known machine tool builder has issued a series of price-lists, each to remain operative one month, and each containing an advance over that which precedes it. Nearly half a year is covered. Like most other changes in schedules, these include elements of readjustment, but the chief purpose is gradually to raise prices. The works in question is not rushed beyond the limits of early deliveries, for it manufactures standard lines which have not yet felt the strain of a depleted market. The customer who orders immediately will obtain better terms in the way of prices than if he postpones his business 30 days, which is worth taking into account, especially in conjunction with the value of the deliveries

themselves. His advantage will diminish as the months pass by, until he will have to pay prices well above what they are at present—in fact, above the limits reached three years ago.

The experiment will be interesting to watch. The dealers should be able to use to advantage the knowledge contained in the progressive lists; customers will learn from them and the manufacturer himself what they can gain by placing orders early. At the same time the builder does not run the risk of filling his order books at present prices, and thus tying up his shops for months before he can reap the benefits of the higher levels of machine tool values which seem inevitable. During the last period of advancing prices, as has frequently been pointed out, most of the machinery manufacturers did not gain any financial advantage from changes upward until months after they had been announced, because the order books contained so great a volume of business accepted at the lower prices. This is true to-day of certain recent advances, which would have done their makers vastly more good had they been made some months ago, because these lines are already oversold. For the sake of the machine tool trade it is to be hoped that its prices will be adjusted, while the renewed demand is yet young, to what is considered the standard of prosperous times, taking into account the present conditions of labor and materials.

Trade Schools in Reformatory Institutions.

The modern industrial school as a central feature of the institutional experience of boys who have transgressed the criminal laws has been suggested as combining a new source of supply of skilled mechanics, with a most wholesome influence in the process of reformation. Thus far the excellent work that has been done in improving the conditions which surround young offenders during their terms of imprisonment has been largely accomplished by capable penologists, including the practical men who have immediate charge of the institutions. Theorists have advanced all sorts of ideas as to what should constitute the environment of the boys, including their training along practical lines with a view to assisting them in leading decent lives when they are again free from restraint. But the practical manufacturer, the employer of labor, has shown little inclination to perform the important part for which he is equipped in perfecting a system of training that would be of the greatest benefit to this type of youth and at the same time to the community.

It is recognized that during the period of his restraint the lad should be kept well occupied in the schoolroom and in some useful employment besides being directed wholesomely in his recreation. Work on the institution farm is frequently adopted, and the manual training idea has been taken up to some extent. Certain trades have been taught, usually of the simpler sort. But the installation of a modern, well equipped school for thorough mechanical training, with competent instructors, is almost, if not altogether, unknown in such institutions. It is believed, however, that a considerable percentage of boys of this class, trained under a restraint that would insure application, would become efficient workmen.

These necessary penal establishments contain thousands of boys. The modern idea is that they shall be treated well, with as little suggestion as possible that they are criminals. They are trusted to the full limit that their conduct will warrant. Their ambition is stimulated. The purpose is to turn out a healthy, normal boy,

with proper self-respect, and in a great many cases the expectation has been realized. The culprit needed only good influences to develop trustworthy traits. Usually he had had no training worth the name until the law had taken him into custody. There is no greater source of self-respect and self-reliance than the knowledge in a man that he can command a livelihood. A skilled mechanic has that confidence, and each year the reason for it becomes more pronounced, for his services are the better appreciated.

The usual system is to make the term of confinement indeterminate. Good behavior counts for a great deal in this connection and serves as the incentive to do well in the schoolroom, as it would in the shop, in the beginning of the term. It takes no deep study of boy nature to realize that a lad soon becomes interested in most labor which requires the skilled use of his hands. He likes to work with tools. It becomes recreation for him. While some are lacking in the mechanical bent, and a certain number of every group of boys would prove unfitted for skilled shop work, even for these there are occupations in which they can be made useful. With the present demand for mechanics, which is steadily growing, there would be little difficulty in a boy, who had been qualified by practical training, finding employment in his chosen occupation when released from the institution. The suggestion has possibilities of value. Abnormal traits would remain with some boys, and these perhaps would retrograde. But the chances of permanent reform for most of them would be many times greater than if they were left to learn, after their discharge, how to earn a living. The several States could well afford the cost of the system, not only because it would help to better social conditions as a whole, but for the same reasons that cause the establishment of the industrial schools of the cities.

The Accumulation of Material Supplies.

A recent article on the outlook in the automobile industry for 1910 had this to say on the situation as it relates to the materials of automobile construction:

Preparations being made to build automobiles are on so vast a scale that the market for raw material is rapidly being depleted. Besides the many new companies that are forming, some of which are so well advanced that they have models on the road, the established concerns of magnitude are enlarging their plants, in numerous cases more than doubling the output. In the meantime producers of raw material were not prepared for so vast a business, and would have been pressed in furnishing barely the amount of material used in 1909, for the cars that were but recently finished. Under the circumstances, the vast increase in the number of automobiles being built has resulted in a famine of raw material, and parts makers are all working up to the limit, with plant increases going on, governed, not by the amount of business they can command, but by the amount of raw material they are able definitely to contract for. At the plant of the ——— Company, foresight is represented by a yard full of chassis frames, motor cases by the half acre, cylinders and other parts to match, rather tending to show that this company does not intend to participate in a material famine.

The singular position of the automobile industry throughout the months of depression has been repeatedly a subject of comment. The exceptional demands upon the makers of parts and the impossibility of rapidly wheeling into line additional capacity to supply such demands have been recognized features of the industrial situation for months. Important a factor as automobile building has become, not only in the machinery trade but in the special branches of the iron and steel trade from which its materials are drawn, it may yet be taken as a criterion to a greater extent than is warranted. The rapid mounting of iron and steel production to new records has created a feeling in some quarters, such as that reflected in the above quotation—a feeling present in greater or less degree in every period of recovery. It

is accompanied often by the seeming belief that business expansion can have no limits and that the supply of materials being definitely limited, it is incumbent on the buyer to provide for the distant future.

Attention has already been called in these columns to the establishment, on a new basis, of stocks of iron and steel of every description throughout the country, as one of the factors in the present enormous demand upon blast furnaces, steel works and rolling mills. What was considered a proper working margin, measured by the scale of demand in a year like 1908, must be much increased, with operations in all metal working lines on the basis of recent months. Every foundry, machine shop, blacksmith shop, repair shop, every hardware store, has participated in the movement to rebuild stocks to the proportions required by steadily expanding business. In a larger way the warehouses for all classes of iron and steel material have called upon the rolling mills for the replacement of stocks that in many cases ran down to a beggarly minimum in 1908. It is quite possible that some estimates of the new scale of iron and steel consumption to which the country has been advancing apparently by leaps and bounds have made too little allowance for this feature of the present remarkable movement.

CORRESPONDENCE.

Interior Waterways Needed.

To the Editor: I notice an article in *The Iron Age* of September 23 showing what bearing the tariff has had on the trade in iron and steel products on the Pacific Coast, and indicating that the Europeans are able to market their goods there cheaper than the Americans residing in the interior of America.

It seems to the writer, who resides on the Ohio River, that the manufacturers of all products, not alone steel products, should use all the influence they possess to bring about the early appropriation of the money to build with, and the rapid construction of a series of locks and dams on the Ohio River from Pittsburgh to Cairo, and should also do their best to get an appropriation for the lakes to the Gulf route, deepening the channel of that water way, so as to permit the passage of heavily loaded vessels from the interior points to the Gulf of Mexico. This work should go along very rapidly, and the Government should issue bonds with which to do the work, so that the entire work will be completed and ready for the use of the American people by the time the Panama Canal is ready.

The Panama Canal would be of much greater value to the Americans who are building it, if our water borne commerce from the interior of the United States can reach deep water through its natural water ways, the Ohio and Mississippi rivers. Upon these two streams, particularly upon the Ohio, are located our great steel industries and our extensive coal mines, and on this heavy merchandise the rate of freight should be so low that we could reach our Western coast as cheaply as does the European at the present time. Our American people will only get the benefit that they are entitled to out of the Panama Canal through the deepening of the rivers in the interior of the United States, so that they and the people residing along the banks of such streams will be able to reach all the commerce of the world, because of the deepening of the channels of our natural water ways.

J. ED. GUENTHER.

OWENSBORO, KY., October 9, 1909.

Internally Fired Helical Furnaces.

To the Editor: In your issue of September 2, pages 698-9, you illustrate an internally fired helical furnace, represented to be the design and manufacture of other than this company; and in your issue of February 25 last you illustrate the same furnace as the design and manufacture of the W. S. Rockwell Company. We beg

to call your attention to the evident make up of a cut, Fig. 1, in your issue of September 2, from the cut, Fig. 2, in your earlier issue, and to say that the W. S. Rockwell Company holds the only existing patent for a furnace of this character and has not licensed any other to make or sell the same.

W. S. ROCKWELL COMPANY,
W. S. ROCKWELL, President.

NEW YORK, September 8, 1909.

To the Editor: Referring to the letter of the W. S. Rockwell Company, which is published in this issue, regarding the article describing the Rockwell inclinable rotary furnace, published in your issue of September 2, we beg to state the following:

There has been no attempt on the part of the Rockwell Furnace Company to in any way invade the rights of others. On the contrary, this company is the successor to the business of the Rockwell Engineering Company (now in liquidation), and has taken over all the rights of that company, together with its good will and other assets. The furnace shown in Fig. 1 of the article published September 2 was built by the Rockwell Engineering Company, our predecessor in business, and we are certainly therefore well within our rights when we describe and illustrate machines built by our predecessor, whose rights we have acquired.

It is being brought home to us, more and more, that confusion exists in the public mind as to who are the successors of the Rockwell Engineering Company. This confusion is accentuated by the fact that another concern uses the name "Rockwell" in such a manner that the average busy man is at a loss to understand just the relation between the various companies.

ROCKWELL FURNACE COMPANY,
F. S. GARRETT, President.

NEW YORK, September 18, 1909.

Copper Production and Stocks in September.

The monthly report of the Copper Producers' Association shows an increase in copper stocks in this country during September of 15,840,207 lb. Both production and deliveries were less than in August. Production and consumption for the month and stocks on hand compare as follows with the figures for August and July:

	September. Pounds.	August. Pounds.	July. Pounds.
Stocks	135,632,565	122,596,607	154,858,061
Production	118,023,139	120,597,234	118,277,903
Totals	253,655,704	243,193,841	273,135,664
Domestic deliveries..	52,105,155	59,614,207	75,520,083
Exports	50,077,777	48,382,704	75,018,974
Total consumption...	102,182,932	107,996,911	150,539,057
Stocks remaining...	151,472,772	135,196,930	122,596,607

A note appended to the official statement says: "From sources which have not hitherto come to the knowledge of the association, it has within the present month been learned that, in addition to what has been recorded during the year, there has been produced from January 1 to August 31, 3,007,738 lb., of which has been delivered to August 31, 2,572,103 lb., leaving a balance on September 1 of 435,635 lb., which has been included in the total stock of September 1."

Bull Dog Core Wash.—The S. Obermayer Company of Cincinnati, Chicago and Pittsburgh, after several years' experimenting, has placed on the market a new product for the foundry called Bull Dog core wash. It is so-called because of its great adhesive qualities. In the foundries where it is now in use there is no trouble caused by the core wash burning off or "peeling" off. The largest castings can be made by using it, and it will be found more satisfactory. In making cores, no matter how much pains may have been taken in other ways, all the good work will go for naught if the right kind of core wash for the job is not available. The only use for a core wash is to prevent the iron from sticking to the sand and to produce a clean, smooth surface. This is precisely what the manufacturers claim Bull Dog core wash will do.

INDUSTRIAL EDUCATION.*

A Source of Supply Increasing the Efficiency of Machinists.

The Cincinnati Plan.

BY FREDERICK A. GEIER, CINCINNATI.

The rapid development of the manufacturing interests of our country during the past decade, and particularly in the metal working lines, is yearly increasing the problem of finding an adequate supply of labor and of a proper degree of efficiency. The system of education in this country has not, until the recent past, taken cognizance of the change in the requirements of labor that has come about through this industrial development. Manufacturers have for some time realized that the efficiency of the labor that offers itself for employment is not as high as it should be. To a large extent this is due to the fact that the great majority of applicants have not gone beyond the elementary schools, and in which they were not prepared for meeting the problems that confronted them upon entering the manufacturing establishments. The courses of these elementary schools have not been such as to hold the interest of the boys, a great many leaving the schools at entirely too early an age, and with a very poor foundation even in the rudiments of education.

Manufacturing processes are becoming more highly organized, and, while there is a greater subdivision of labor, I believe it is true that we need a working force to-day of greater general intelligence than in the days when simpler machines and simpler processes were employed in producing our work. A careful analysis of the conditions in any manufacturing plant will reveal a tremendous waste, because of the abuse of machinery and tools, a low standard of work, spoiled pieces, &c., a great part of which waste could be eliminated if there were a higher degree of intelligence on the part of the workmen.

America has led the world industrially because of the natural advantages of a large home market and of its superior advantages as to the cost of raw materials. Europe, and notably Germany, largely offsets our natural advantages by a superior training of its employees. Our advantages as to sources of raw materials are lessening year by year. If we are to increase our home and foreign trade we must better train our employees. The movement to this end has begun and I am asked to speak to you more specifically as to what has been done in Cincinnati.

Cincinnati has the oldest mechanics' institute in this country. This institution, with its night classes, has been doing pioneer work along these lines for many years. It is, however, not a natural condition for young men to be compelled to get their education in this way. Boys attending these schools, tired out from the day's work, can't make the progress that they should, and often become discouraged. About four years ago the Board of Education of Cincinnati established manual training in the elementary grades. Two magnificent technological high schools are about completed, and in these schools such training will be given as will be exceedingly useful to the boys, as they subsequently enter manufacturing establishments. The courses comprise woodworking, metalworking, foundry work, mechanical drawing, and such allied branches as physics, chemistry, &c.

You all know about the co-operative course for engineering established three years ago at the University of Cincinnati, in which boys who have passed through the high schools can enter this six-year course, working one week at the shop and one week at the university, earning, during the period of six years, about \$1,800. About 200 of these boys are now employed in Cincinnati shops. While there are exceptions to the rule, as a class these boys have surprised their employers as to the

character and quality of work they are able to do. In fact, the experience has been very satisfactory. Right in the beginning there was considerable skepticism on the part of manufacturers and a reluctance to accept these boys. The shops to-day are offering to take on more new men than the university facilities, at present, can take care of.

In our own plant, we have found some of these boys available for some of our most difficult work, and this is also true in other shops. I call attention to this, because the experience with these engineering students has practically demonstrated to the Cincinnati manufacturers the value of educated and properly trained young men. The great mass of our employees, however, in the future, as in the past, will be supplied from those who only complete the elementary courses.

About three years ago, Houston, Stanwood & Gamble established a school in their own shop, giving instruction to their apprentices during shop hours. Their experience was so profitable that about a year later the Cincinnati Milling Machine Company established a similar school. We first attempted to operate this school at night, but, because of the difficulty in insuring an attendance on the part of the boys, we soon decided to also operate this school during working hours. These two schools were noticed by other manufacturers, and were also brought to the attention of the Board of Education. After a number of conferences between the manufacturers and the members of the Board of Education it was decided, beginning with September, to operate a continuation school under the auspices, and at the expense of, the Board of Education. It was agreed by the manufacturers that they would send their apprentice boys and other young men to this school four hours per week, paying regular wages while the boys were in attendance. Over 200 boys are now enrolled, and, as fast as additional teachers can be provided, there is no doubt that this enrollment will be very greatly enlarged. You must remember that, at present, the boys that attend the continuation school are all employed in machine shops. The course has not yet been brought to embrace the other industries in Cincinnati. The classes of this continuation school are limited to about 20 boys. They are taught elementary and higher mathematics, including problems in geometry and trigonometry. The whole plan of the school is to teach directly the problems that the boy encounters in the shop. The catalogue and blue prints of the machine manufacturers of Cincinnati are the text books, and through the co-operation of the superintendents the engineers employed in the shops of Cincinnati the work done at this school to-day is probably more practical and more effective than of any school in this country and in Europe. The efficiency of these boys in the shop is already showing substantial improvement, and will increase as the teaching force and courses at this continuation school are amplified.

So much for the efficiency. Now as to the increase in the supply of labor. It was formerly exceedingly difficult to secure a sufficient number of candidates for apprenticeships. You can readily see that parents whose attention is now called to this new plan appreciate at once that here is an opportunity for their sons to learn a trade and at the same time to supplement their education. It also appeals to the boy. He wants to go to work, and, while heretofore he has been indifferent to his studies at school, he now finds instruction that is alive with interest. The supply, therefore, of young men to learn the trade is more than sufficient. So much already has been accomplished that I look forward to the future with much hopefulness, and I sincerely trust that other communities will rapidly imitate Cincinnati.

Let me repeat that the big problem before manufac-

* Read before the National Machine Tool Builders' Association, New York, October, 1909.

turers of this country is to secure a larger and more efficient supply of labor. Industrial education is the remedy.

The Fitchburg Plan.

BY M. A. COOLIDGE, FITCHBURG, MASS.

We needed more and better mechanics in Fitchburg. The manufacturers were prepared to start a course of apprenticeship with a special instructor. Professor Schneider's plan modified seemed to have advantages.

The Fitchburg plan of co-operative education, or co-operative industrial education, as applied to mechanics, is an arrangement between the high school and the manufacturers of metal machinery, saws, engines, pumps and condensers, and other metal products, for a four years' course of apprenticeship, the first year all school work, the next three years school and shop work, one week in school and one week in the shop. The boys work in pairs—as an example, if a shop takes eight apprentices it has four working at all times. The boy going to work next week goes to the shops on Saturday before closing time, for an hour or half hour according to the nature of the work, and watches the job his alternate is on, and then is prepared to take up on Monday morning the operations he has previously made himself familiar with and with such additional information or instruction he feels he may need from his foreman.

When the shops are able to take a sufficient number of operatives under this system, the course can be very much improved, we believe, by a special instructor in each shop whose only duty will be to attend to his boys, giving them all the time and attention necessary. We expect to carry out this feature shortly.

The Fitchburg plan differs from the trade school idea where any student may enter and go wholly through a three years' course without regard to his mechanical ability or fitness for such work, whereas we drop out the dead wood and try to bring out every boy a good, high grade mechanic. In one trade school they wanted some plumbing done in the school itself and, though they taught plumbing in this very school, they had to send out and get a plumber to do the work. With the exception of the Williamson school in Philadelphia it is, as far as I have heard, the only one where the shop part is made at all prominent.

Manual training schools have also failed in their effort to do practical work along the line of the Fitchburg plan primarily, I believe, for two reasons: They have failed to put the shop part on an equality with the academic and were not able to work under real commercial conditions. Under the Fitchburg plan the boys are paid for their time in the shops 10 cents per hour the first year, 11 cents the second year and 12½ cents the third year. The young man taking this course has just the same standing in the high school on the football team, athletics, lectures, and all advantages as the other students and put it all over the other boys by always having some real money to do as they wish with, and enjoying that feeling of independence, human in us all.

The apprenticeship or school year commences July 1 and for two months it is a trial period exactly the same as in our former apprenticeship systems. If the boy does not care to continue he may stop, and if the manufacturer feels that he will not make good as a mechanic, he is told so. If he continues, he is under the same apprenticeship bond to go through the three years' course as formerly. We believe this form of bond, or obligation, is just as valuable as formerly, and is kept in mind by the apprentice that he has entered into a business agreement, approved and guaranteed by his parents.

The four years' course follows:

	Periods per week.
First year, All school work:	
English	5
Current events; industrial history.....	2
Arithmetic, tables and simple shop problems.....	5
Algebra	5
Mechanics, simple machines.....	3
Freehand drawing.....	6

Second year, school and shop work:

English	5
Industrial history, civics, American history.....	3
Shop mathematics.....	7
Physics	4
Mechanism	5
Freehand and mechanical drawing.....	6

Third year, school and shop work:

English and industrial history.....	5
Shop mathematics.....	5
Physics	4
Chemistry	4
First aid to injured.....	1
Mechanism	5
Freehand and mechanical drawing.....	6

Fourth year, school and shop work:

English	5
Shop mathematics.....	5
Physics, electricity.....	4
Chemistry	4
Commercial geography and business methods.....	2
Mechanism	4
Freehand and mechanical drawing.....	6

The above scheduled studies, detailed as follows, show how interesting and instructive the school work may be made:

English: Throughout the four years' course in order that he may speak and write intelligently, forms of business papers, shop terms and spelling.

Mathematics: Simple tables, lengths, areas, volumes, metric system, circular measure. General shop mathematics dealing with problems on cutting speeds and feeds, gearing, belting, strength of material. Algebra to facilitate in working out shop formulas.

Mechanism: Parts and construction of different shop tools, gearing, cutting threads, forms and action of cutting tools.

Freehand drawing: For quick shop sketching.

Mechanical drawing: To help in reading blue prints and make up shop drawings if necessary.

Industrial history: History of iron industry, factory system and labor problems, new inventions, reading mechanical journals to keep in touch with progress in mechanical affairs.

Physics and chemistry: As applied to everyday shop practice, simple and common methods of testing iron and steel, hardening and tempering.

Commercial geography: Centers of machine manufacture, source and cost of materials, labor conditions, railroad systems, waterways and cost of transportation.

William B. Hunter, a technology man, with ten years' practical shop experience, is the special instructor in charge of this work, and the subjects taught in the course as just outlined are from special text books following the shop work very closely, cutting out the old academic studies entirely.

Joseph G. Edgerly, for thirty-five years superintendent of the Fitchburg schools, has done everything possible to make this co-operative plan a success, and it has proved up to date that this idea as outlined is the best course along co-operative lines.

The city authorities, high school committee, high school principal, teachers, citizens, and various organizations, have done all possible to make it such a success that the apprentices, their parents, and the manufacturers seem pretty well satisfied that here is a line of study and work on an actual commercial educational basis.

The scheme is adopted and worked out to fit our conditions along University of Cincinnati lines, as conducted by Prof. Herman Schneider, to whom we owe a great courtesy for the attention he has shown us.

J. P. Koeler & Co., dealers in iron and steel, Pittsburgh, Pa., have purchased the property of the Refined Iron & Steel Company, located on the Pittsburgh & Lake Erie Railroad, about 10 miles west of Pittsburgh. The plant was sold at receiver's sale, subject to confirmation of the court, for \$100 above the bonded indebtedness, which amounted to \$150,000. It had been in operation about 18 months when the company suspended. The equipment, which is very complete, includes seven double puddling furnaces, three pile furnaces, four trains of rolls, comprising one 22-in. muck, 9-in. and 12-in. finishing, and 16-in. billet and finishing, and a well furnished machine shop. The annual capacity is 25,000 tons of muck bar and merchant iron. The purchasers state that the plant will be put in operation as soon after confirmation of sale as possible.

THE NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION.

The eighth annual convention of the National Machine Tool Builders' Association, held on Tuesday and Wednesday, October 12 and 13, at the Hotel Astor, New York, was marked by the largest registration of members ever noted at an opening session. The meeting, in consequence, proved to be one of the best ever held by the association, and it resulted in bringing out discussion on some matters of new importance in the development of machine tool construction. Of particular interest was a discussion on the application of motor drive to machine tools which will result in further investigation and developments along those lines.

The Rochester delegation enlivened the meeting by beginning a vigorous campaign to land the spring convention for that city even before the first session was called to order on Tuesday. They distributed badges announcing that Rochester was the best convention city in America, and bearing the terse and confident inscription: "I will meet you in Rochester next year." They also distributed a booklet calling attention to the beauties of Rochester and its environments and supplemented the booklet with arguments which abounded with local pride. Secretary W. P. Davis was the leader in this Rochester movement and he succeeded in obtaining many recruits before the convention was well under way, if the badges worn by many members could be taken as a criterion.

TUESDAY MORNING'S SESSION.

President Fred L. Eberhardt, of Gould & Eberhardt, Newark, N. J., after the usual roll call announced that the J. Morton Pool Company, Wilmington, Del., had been elected to membership. The following convention committees were announced: Auditing Committee—E. P. Bullard, Bullard Machine Tool Company, Bridgeport, Conn.; C. A. Hoefer, Hoefer Mfg. Company, Freeport, Ill. Committee on Resolutions—C. A. Reck, Rockford Drilling Machine Company, Rockford, Ill.; E. M. Woodward, Woodward & Powell Planer Company, Worcester, Mass.; William Lodge, Lodge & Shipley Machine Tool Company, Cincinnati. Nominating Committee—J. V. Doan, American Tool Works Company, Cincinnati; A. T. Barnes Company, W. F. & John Barnes Company, Rockford, Ill.; C. H. Alvord, Hendey Machine Tool Company, Torrington Conn. Committee to Meet the Committee From the American Supply & Machinery Dealers' Association—I. H. Johnson, Jr., I. H. Johnson, Jr., Company, Inc., Philadelphia; Charles Hilker, Hamilton Machine Tool Company, Hamilton, Ohio; H. E. Flather, Flather & Co., Inc., Nashua, N. H.

After these preliminaries the president presented his annual report which was in part as follows:

President Fred L. Eberhardt's Address.

Again we have assembled at Mecca, to hold our eighth annual convention, in accordance with our custom and constitution, just following in the wake of the most gigantic public celebration that not alone this city, but the world at large, has ever witnessed—the Hudson-Fulton celebration—immortalizing one, an explorer, the other, a mechanic, whose work and efforts were somewhat in the line of navigation, and who, if it were within his power to return to-day, would stand aghast at the many wonderful methods of transportation which are now accomplished facts, and this, too, all witnessed during the past fortnight, within the bounds of this one city. I refer to travel:

Above and below water, by vessel,
By tunnel under our rivers and highways,
By bridges over our rivers,
Above and below earth's surface by trains propelled by steam and electricity,
By aeroplane like a bird on a trackless road, over all.

We are truly living in a wonderful and hitherto unknown age.

In assembling to-day we are renewing and continuing a practice which has, without fear of contradiction, proved a benefit not only to the individual, but to the various concerns represented; the trade as a whole and the country at large. Our association is not only growing to be, but is, an established factor for great good and usefulness. Our de-

liberations are watched with interest and our actions quoted and given world-wide publicity. It, therefore, behooves us to think clearly, deliberate carefully and act wisely.

During the past year this association has taken a step which to me seems to have been a most important and far-reaching one. I refer to our advocating a reduction in the tariff on our goods manufactured in foreign countries; thus reversing, to a large extent, what to some of us had come to be considered almost second nature, in our more or less fixed custom which has prevailed for a generation in successfully carrying on and building up so many business enterprises, which have made this country what it is. Time alone will prove or disprove the wisdom of this change.

We have brought to the attention of the authorities at Washington—the Department of Commerce and Labor, including the Bureau of Manufacturers, Bureau of Statistics and the Census Bureau—the industry which we represent, emphasizing its size, importance and needs; have aroused interest and set in motion activities which are bound to work for our good as time goes on. We have not only advocated a revision of the metal working classification, but obtained a respectful hearing with reference to our industry, which will show results during the taking of our next census, and which we believe will be helpful for our customers' officers in performing their work throughout the country.

Our association has been instrumental in having continued during this year the good work being performed in Europe by Captain G. L. Carden, whose work in our behalf will cease for the present, on December 31, unless some further action be taken.

Our association provides a wider acquaintance among manufacturers, and its work stands, if for nothing else, for "education." Around this one word, to my mind, should cling all our efforts and accomplishments. It provides the occasion for clearing away any misunderstandings, by meeting one another face to face and, through the friendly exchange of ideas, breaking down and smoothing away the many forms of feeling so often exhibited and experienced between competitors; or, in other words, to better understand the other fellow. It also strives to educate and uplift the ideas of manufacturers of machinery, as to the various fundamental elements of cost that they should be careful to include; the many items of expense which actually exist, but do not appear on the surface and are often overlooked by so many, especially by beginners, and not infrequently by those of longer experience. The history of the past two years will prove to every thoughtful manufacturer the truth of this statement.

Six months ago we only believed that the trade corner of the recent business depression had been passed; to-day we are sure of it.

I suggest that each committee, not already so working, seriously consider and adopt maximum dimensions for the various essential parts of a machine of given size.

The report of Treasurer W. P. Davis, W. P. Davis Machine Company, Rochester, N. Y., showed the association to be in excellent financial condition, and Secretary P. E. Montanus, of the Springfield Machine Tool Company, Springfield, Ohio, said that he had nothing to add to the reports of the other officers and instead presented an interesting report of the Committee on Standardizing Electric Motors as Applied to Machine Tools, which was offered in behalf of Paul A. Montanus, chairman of the committee, and his fellow members, B. B. Quillen and John Le Blond. President Eberhardt interrupted long enough to explain that about a year ago he met Charles Robbins, of the Westinghouse Electric Company, who informed him that the American Association of Electric Motor Manufacturers, recently formed, was interesting itself in the matter of standardizing electric motors for motor drive as applied to machine tools. At Mr. Robbins's suggestion that the two organizations take up this work together, the chairman explained that he took it upon himself to appoint a committee in order to get the advantage of the ensuing year's work. The association ratified the president's action and Mr. Montanus then presented the report of the committee, which was in part as follows:

The Standardization of Electric Motors Used in Connection with Machine Tool Drive.

The committee first wishes to state that this report is merely a preliminary one, as the subject in hand is a large one involving many details, which can only be worked out by

correspondence and meetings. The first meeting was held about the first of the year, and was a joint meeting between the American Association of Electric Motor Manufacturers and your committee. The work of this meeting consisted principally in the discussion of speeds, both constant and variable speeds and motor dimensions. The Motor Manufacturers' Association is endeavoring to become more familiar as a body with the requirements of the machine tool builders, so that they can put on the market a new class of motors known as machine tool motors, and it was with this object that they met our committee.

However, being only three in this committee, we felt a little hesitancy in rendering our opinion as being that of the association without first getting at least the opinion of the various members. To this end a circular letter was sent out under date of September 14, in which a few questions were asked.

The first question asked was: If all the manufacturers of motors were to make their base dimensions and other important dimensions alike for a given horsepower, would it not be beneficial to all? The question, as all will readily foresee, brought the unanimous answer of "Yes."

Question No. 2, regarding the tolerance of 1-32 in. variation of printed dimensions, brought 34 per cent. of the answers in favor of such a tolerance; 16 per cent. required exact dimensions.

With regard to Question No. 3, whether shaft should be standard, or plus or minus a thousand, 63 per cent. were in favor of standard; 23 per cent. required a thousand above; 14 per cent. a thousand below, while one manufacturer recommended that the smaller motors should be a thousand above size, and as shaft increased the number of thousand above standard should also be increased.

This committee asked that our association, as a whole, impress the importance of these three first questions upon the manufacturers of motors, as they are of great help to the manufacturers of machine tools and are the three questions upon which all can agree. Our attention has been called to a few motor manufacturers who core the base holes instead of drilling them, and we most urgently recommend that the base holes be drilled from a template, which template should be interchangeable among the various motor manufacturers for a given horsepower, and furthermore that the shaft be placed in the motor so that it shall be parallel to the base, as we have heard several criticisms on this last mentioned point.

Regarding Questions 4 and 5, which refer to the maximum speed of motors, both constant and variable, and also to the peripheral speed of gears, the committee finds quite a diversity of opinion. From the report we find that for constant speed work the majority seem to favor 1200 rev. per min. on most of the smaller motors, at least up to 5 hp. There was, however, a difference ranging from 900 to 1800 rev. per min. Where raw hide pinion is used it was found that the maximum speed was somewhat higher, but that still 1200 rev. per min. was most commonly used. With metal pinion this was somewhat lower.

It is with respect to the speed of motors and their variations we found the greatest difficulty at the joint meeting with the electrical association. The speeds were so arranged and based on the following suggestions: That the starting basis of constant speed of the A. C. current, 60 cycles, be used as the basis of the D. C. constant speed motors, and also that this be used as a basis for the working out of the variable speed requirements. These speeds were suggested as follows: 600, 720, 900, 1200 and 1800 rev. per min.

These figures are not absolutely the correct ones for the above condition, but are approximately close enough for discussion purposes. In all the speed tabulation it is understood that the variation of 5 per cent. up or down be allowed. The table which we submit below is the first and the basis upon which the two committees are working.

Variable Speed Motors.

Horse-power.	Maximum speed.	Range.			
		4 to 1.	3 to 1.	2 to 1.	1½ to 1.
1.....	2,200	550	740	1,100	1,480
2.....	2,200	550	740	1,100	1,480
1.....	1,800	450	600	900	1,200
2.....	1,800	450	600	900	1,200
3.....	1,800	450	600	900	1,200
5.....	1,800	450	600	900	1,200
7½.....	1,800	450	600	900	1,200
10.....	1,800	450	600	900	1,200
2.....	1,500	375	500	750	1,000
3.....	1,500	375	500	750	1,000
5.....	1,500	375	500	750	1,000
7½.....	1,500	375	500	750	1,000
10.....	1,500	375	500	750	1,000
15.....	1,500	375	500	750	1,000
15.....	1,200	300	400	600	800
20.....	1,200	300	400	600	800
25.....	1,200	300	400	600	800
30.....	1,200	300	400	600	800
20.....	900	225	300	450	600
25.....	900	225	300	450	600
30.....	900	225	300	450	600
40.....	900	225	300	450	600
30.....	720	180	240	360	480
40.....	720	180	240	360	480
50.....	720	180	240	360	480

In order to explain this table we will take the 2-hp. size. In it we will suggest the maximum speed as 2200;

the 4 to 1 range would, therefore, be 550 to 2200; 3 to 1 range, 740 to 2200; 2 to 1 range, 1100 to 2200, 1½ to 1 range, 1480 to 2200. This would require four motor frames to carry out this standard. If any manufacture should decide that 2200 revolutions is entirely too high he has the following ultimate: If he uses a 2 to 1 motor, he can use a speed variation as low as 500 to 1100 or 740 to 1480. If the 3 to 1 is required, he could use 550 to 1480, or at least that frame. Therefore, it would seem that while the table may be somewhat high, the number of combinations which could be taken therefrom would be sufficient to meet the requirements of nearly every motor manufacturer. In this table he could also take a 2-hp., with a maximum speed 1800 revolutions. With this he could get a 4 to 1 speed variation, 3 to 1, 2 to 1 and 1½ to 1, with the maximum speed of 1800, 1200 or 900 for a 2 to 1 motor. This is also sufficiently large to meet nearly all requirements.

Discussion.

Mr. Lodge opened an interesting discussion on the report by stating that it was his opinion that the speeds of motors as arranged in the committee's report were too high and he suggested that a speed of about a 3 to 1 rate might fit the matter better. Mr. Woodward declared that five years ago the machine tool builders tried on their own behalf to get the manufacturers to standardize and were unsuccessful, but now that the motor manufacturers are interested in the matter things might be arranged. The trouble at that time, he explained, was that every electric motor manufacturer wanted his own line made the standard. Mr. Lodge found that a speed of higher than 900 rev. per min. was fitted only for belt gear, as it has been his experience that direct connected gears did not stand the strain. Mr. Montanus supplemented this by saying that the association certainly should make some attempt to standardize motor frames, considering that manufacturers are willing to co-operate with the organization in its investigations. Mr. Roth, of Chicago, representing the motor manufacturers' association, said that his organization was very much alive to the subject and he believed that they could solve any of the problems machine tool builders might put up to them, and the only obstacle might be a matter of price. He declared that eventually the manufacturers will evolve so many different ranges of speed that they will be able to meet any conditions. Mr. Lodge again stated that he would agree to advocate a 3 to 1 speed provided that the maximum would not be made more than 900 rev. per min., and at his suggestion the Committee was continued and instructed to co-operate with the committee from the motor manufacturers' association.

Max Viewgard, American manager for the American exposition to be held in the city of Berlin during the months of May, June and July, 1910, was afforded an opportunity to tell the association that the project he represents is to be an all American exhibition, and he urged the members to give the scheme their support.

The association then received a committee from the American Supply & Machinery Dealers' Association, consisting of Henry Prentiss of the Prentiss Tool & Supply Company, New York; Percy Brotherhood of Manning, Maxwell & Moore, New York; and O. P. Meckel of the Baird Machinery Company, Pittsburgh, Pa., and several requests made by the committee were referred to the various tool committees.

A member of the association next presented an interesting address on

The Creation of Machinists

which was, in part, as follows:

Referring to the title of the paper, I will merely mention the matter of apprentices, because the subject of this paper is more to show how to create machinists without passing through an apprenticeship, because of the extreme shortage of machinists throughout the whole United States.

A few years back we found that we were unable to obtain boys as apprentices, for the reason that they could get better pay in other trades, such as shoe factories, tobacco factories, tanneries, dry goods and other stores, and this caused us to raise the hourly rate, which was originally 5 cents to 8 cents. But at that time we were allowed to use boys between the ages of 14 and 16 years. Since then a law has been passed in our State prohibiting boys working more than eight hours, under 16 years of age, and in order to comply with this law we discharged all boys

who were under 16 years. We then found, speaking for our own company, that in order to get a sufficient supply the rate must again be raised from 8 cents to 9 cents per hour.

Simultaneously with this difficulty on obtaining boys came the great activity among the builders of automobiles. This occurred during the time that business was very dull in the machine tool line. When business became active once more, having the addresses of all of the machinists who were formerly employed with us, and having sent to each one a letter, stating that they could return to work, we were surprised to find almost no responses; and we then saw that we should be obliged to go into the creation of machinists on rather a large scale. We decided to rearrange our work and divide it into very much smaller items than heretofore, arranging the parts so that they could be machined with the greatest possible simplicity and then set about inquiring for men, not machinists, and we advertised for: "Young men between the age of 20 and 30 years. Fair wages and good opportunities for advancement. Men accustomed to safe making or carriage making preferred."

The first day following this advertisement we obtained 12 out of possibly 30 applicants. They were selected largely because of their former experience, and somewhat upon their personality, personal appearance and address. These 12 men were placed, one in each of twelve departments, with instructions to the foremen as to the pieces they should be taught how to produce. We found that by this method the first installment of 12 were readily assimilated, so that within one month we were ready for similar installment.

Now, to give you some idea as to how we proceeded in the matter. We arranged with a first-class machinist who has been with us a long time, and in whom we have a great deal of confidence, and who possesses the art of knowing how to teach, to go from one man to another, see how he was performing his part of the work, set him right when he was wrong, and give him further explanations when an additional piece was added to the work he had already been taught. All of this involved the installment of some new tools, and in the beginning a slower production; but as these young men became better acquainted with the work we advanced them from 15 cents to 17½ cents per hour, and some of them to 20 cents per hour, and it does appear as though quite a number of them within a very short time may be advanced to 22½ cents, from that to 25 cents, and so on. As this advance takes place they will, of course, have been taught how to do additional pieces.

All of this taxes the patience of the foreman quite considerably and results, of course, in more spoiled pieces of work, but the final result, of obtaining a sufficient number of men to run the establishment, is brought about. There is the further advantage that men with the limited knowledge that these men must necessarily have do not have the confidence to change into other shops so readily as the regular machinist.

There is another reason why machinists are so scarce, and that is the many fields to which they are called, and which fields do not make machinists. Let any one call to mind how many machinists are now employed in hotels and large office buildings for running the elevators and electric light plants; how many are now taken for street railroads; besides all those who are taken into the office and drawing room or who are sent out on the road. Every consumer of machinists should be a producer; in the trades mentioned they are not producers and consequently it is advisable for every machine shop, regardless of business conditions, to start more beginners than they need. The shop itself will require an increased number when the beginners graduate; some will drop out, some will be dropped, and others enticed into new enterprises which must have machinists ready made.

Beginners once obtained should be encouraged at every step. They should be given as little disagreeable work to do as practicable. They should be given the best work to do which they are capable of doing. They should be made machinists at once, if their capabilities permit of it. A vacancy for even one hour in a higher place should be filled for that hour by one from a lower place. All the employees should be given all the encouragement possible; that would take them into night schools, trade schools and correspondence schools. Wherever there is a serious shortage, the men in your employ should be asked to invite any of their acquaintances to make application for employment in the machine shop.

Very strict orders should be given to all foremen and superintendents to use every endeavor to retain any man who wants to leave, or any one they are inclined to discharge. This is of the utmost importance, as otherwise it keeps a regular stream of men coming into the place and leaving it unless special care is taken. One of the manufacturers in Detroit told me a few days ago that he was obliged to discharge and take on 750 men every month. It is not to be expected that we can create machinists in a short space of time without giving the method of doing it a great deal of care, and unless the man was a drunkard or had an exceedingly bad disposition, good treatment and a sufficient amount of tact and patience will retain a great many who are otherwise discharged.

E. P. Bullard, Jr., who was also down to discuss the subject, spoke briefly and to the point. Mr. Bullard, while admitting that the general apprenticeship system was a good one in many cases, stated that his firm had been very successful with special apprenticeship, especially considering the fact that skilled mechanics are scarce. Mr. Bullard said that they had best solved the problem of getting men to become machine builders by offering them special courses and teaching them one branch of the trade only. "For instance, we put a recruit," he said, "on a milling machine only, or, perhaps, a grinding machine only, and make of him a good milling machine hand or a good grinding machine hand. This requires a relatively short space of time and sometimes as low as one year only is required to make the new man a skilled mechanic. Your all around man is going to become a specialist eventually, and with the increasing need of skilled mechanics we should take this course of making them. Frequently an apprentice who desires to take the general course cannot get enough money from it to support himself during a period of apprenticeship. We have taken in older men and given them wages sufficient to keep them until they become proficient enough to obtain a diploma, and then, of course, they are able to earn regular workmen's wages."

This ended Tuesday morning's session, and the afternoon meeting was given over to the meetings of the various machine tool committees.

WEDNESDAY MORNING'S SESSION.

The second session was called to order shortly after 10 o'clock Wednesday morning to listen to two addresses on the subject of Industrial Education—one by Frederick A. Geier, dealing with the plan which is being followed in Cincinnati, and the other by M. A. Coolidge, with the Fitchburg plan. Both are co-operative arrangements between manufacturers and the board of education of each city and are described in the full text of the addresses given on pages 1169 and 1170.

Supplementing Mr. Geier's address, William Lodge told of a visit he had made to the continuation school and his approval of the sort of instruction given. As evidence of how practical are the lessons given, he cited the use of manufacturers' catalogues as text books to the end of familiarizing the students with the standard machine tools built—their construction and operation. The Lodge & Shipley Machine Tool Company has shown faith in this form of education by sending 40 of its apprentices to the continuation school.

The business of the meeting was dispatched promptly to give all possible time to the lecture by Dr. W. H. Tolman on "The Perils of Peace; or, A Safer America." The Auditing Committee briefly reported its findings of the treasurer's accounts correct and the reports of all other committees were postponed by consent. The National Automatic Tool Company, Dayton, Ohio, was duly elected a member of the association, and a vote of thanks was passed to the management of the Hotel Astor for courtesies shown in the entertainment of the convention. The secretary next read a communication from the Chamber of Commerce of Rochester, N. Y., inviting the association to hold its 1910 convention in that city, setting forth the facilities there available for proper entertainment, and another letter from Mayor Edgerton further urged acceptance of the invitation and pledged the efforts of the municipal authorities to make the occasion a memorable one.

Dr. Tolman's lecture, illustrated with lantern slides, first emphasized the serious need of activity to reduce the mortality and disability of industrial employees by providing safeguards against accident and sanitary provisions against disease. The history of the movement abroad, especially in Germany and France, was covered and particular mention made of the welfare work in the Krupp Works. Examples of devices that have been effective in this and other foreign plants and in the United States Steel Corporation's works in this country and the shops of the Brown & Sharpe Mfg. Company, the Underwood Typewriter Company and others, in reducing the danger to operatives were shown by numerous slides. Finally the speaker outlined the plans for a museum of

safety and sanitation, to be permanently established in New York City, and asked for subscriptions from the members. The lecture was enthusiastically received and Dr. Tolman was given a rising vote of thanks, following which the meeting adjourned for the morning. A report of the last session, held Wednesday afternoon, will appear in our next issue.

PERSONAL.

George M. Gillette, president of the Minnesota Steel & Machinery Company, Minneapolis, Minn., and a member of the Minnesota Employees' Compensation Commission, will make an address on the subject of "Workmen's Compensation from the Employers' Standpoint" at the second annual meeting of the Liability Insurance Association, which is to be held at the Hotel Astor, New York, October 20.

Leo. G. Smith has resigned his position as superintendent of the Bucyrus Steel Casting Company, Bucyrus, Ohio, to accept a similar position with the Londonderry Steel Foundry at Londonderry, Nova Scotia.

The Hill Clutch Company, Cleveland, Ohio, announces the appointment of G. W. Hoffman as sales engineer in charge of its Chicago office, which is located at 610 Marquette Building.

Isaac Guggenheim, treasurer of the American Smelting & Refining Company and the Guggenheim Exploration Company, has returned from an extended European trip.

Victor Giraud, one of the managers of the Berlin office of Schuchardt & Schutte, and Oskar Burghardt, general manager of the St. Petersburg office of the same firm, arrived in New York October 8 from Europe. They will make a tour of the United States for the purpose of inspecting industrial plants in the machinery and kindred lines.

Frank A. Houghton, who has been in charge of the automobile department of the American Locomotive Company, has become general superintendent of the Taylor Iron & Steel Company, High Bridge, N. J.

Wm. L. Hoffman, formerly with Crocker Brothers, New York, and for a time attached to the Philadelphia office of the Tennessee Coal, Iron & Railroad Company, is now connected with the Philadelphia pig iron agency of Hickman, Williams & Co.

A. T. Anderson, Cleveland, Ohio, has resigned as secretary-treasurer of the National Supply and Machinery Dealers' Association. His successor is Thomas A. Fernley, now secretary of the National Association of Jobbers of Wrought Pipe and Fittings.

George C. Campbell, ex-county clerk of Warren, Ohio, has purchased an interest in the Niles Forge & Mfg. Company, Niles, Ohio, and has been elected secretary and treasurer of that company.

M. J. Collins has been appointed general purchasing agent of the Atchison, Topeka & Santa Fé System at Chicago.

C. R. Wilson, formerly of the Jones & Adams Company, Chicago, and previous to that time connected with several coke concerns, has been appointed manager of the Uniontown, Pa., office of the Moreland Coke Company, Bessemer Building, Pittsburgh.

S. A. Richards, for many years general superintendent of the blast furnace of the Struthers Furnace Company at Struthers, Ohio, has resigned, effective December 31.

C. A. Poe, well known in steam practice circles in Pittsburgh, has disposed of his interests in that city and accepted a position with the Wright Mfg. Company and Austin Separator Company, Detroit, Mich., in charge of the mechanical department, succeeding H. H. Humphrey, deceased.

T. G. Bush, president of the Shelby Iron Company and Coosa Pipe & Foundry Company, has returned to his office, at Birmingham, Ala., after a month's recreation at Western resorts.

C. B. Humphrey closes a service of 15 years with the Westinghouse Electric & Mfg. Company, during the last

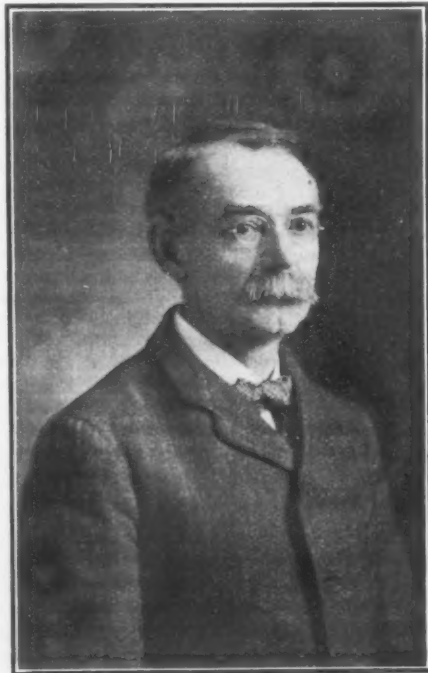
5 years of which he was manager of the detail and supply sales department, to become a vice-president and director of the White Investing Company, 43 Exchange place, New York, which will undertake the financing, development and operation of enterprises based on natural resources, and deals in bonds and securities. W. F. White, president of the company, was formerly manager of the Cincinnati Edison Electric Company, and later vice-president of the North American Company.

A. H. Carpenter, who has been appointed manager of sales for the Southern Iron & Steel Company, has assumed his duties, with headquarters in the Brown-Marx Building, Birmingham, Ala.

OBITUARY.

ALBERT J. PERKS.

Albert J. Perks, president of the Webster & Perks Tool Company, Springfield, Ohio, died October 4, aged 58 years. He was born in Birmingham, England, and was brought to this country by his parents, who located at Dayton, Ohio. When 18 years old he removed to Springfield, where he became interested in manufacturing. He was for a number of years superintendent of the



ALBERT J. PERKS.

bar and knife department of the old Whiteley Mfg. Company, at the present location of the Foos Gas Engine Company. In October, 1891, he severed his connection with the Whiteley interests and entered into a partnership with John F. Webster, to engage in the manufacture of machine tools, under the firm name of the Webster & Perks Tool Company. Mr. Webster died two years later, and Mr. Perks operated the business by himself until 1898, when Herman Voges, Jr., was admitted as a partner. The company still goes under its old name, but has been operated principally by Mr. Voges since Mr. Perks' illness began, some six months ago.

Mr. Perks was an expert in mechanical drawing and designing, and was often called in consultation by business men in other parts of the country. He was also an inventor of a number of high grade mechanical appliances, but, owing to his extreme modesty and retiring disposition, this part of his life's work was not generally known. He was a man of exemplary habits and was highly regarded in the community. He leaves a widow and two sons, one of the latter being George W. Perks, superintendent of the American Seeding Machine Mfg. Company.

JOHN D. TURNER, manufacturer of jack screws, Lowell, Mass., died September 29, aged 51 years. He was a city alderman at the time of his death. He leaves a widow.

Trade Publications.

Chucks.—The Skinner Chuck Company, New Britain, Conn. Booklet. This is a price-list of independent, universal and combination lathe chucks, drill chucks, planer chucks, face plate jaws, drill press vises, reamer stands, &c. The company's standard line of equipment of different character is illustrated, briefly described, and tables of dimensions and specifications are given.

Vertical Self-Oiling Engines.—American Blower Company, Detroit, Mich. Booklet. Contains facsimile responses from users of the A. B. C. type A self-oiling engines who were asked to report on the service these engines are giving, and particularly how often and how much oil they required and how often and where adjustments were necessary. In this way the company is obtaining striking evidence of the small amount of attention these engines demand. A vertical section is given showing the arrangement of the interior lubricating mechanism of the engine, and views of several installations for various purposes are included.

Automatic Mechanical Stokers.—The Wetzel Mechanical Stoker Company, Trenton, N. J. Catalogue, 6½ x 9½ in.; 20 pages. Very fully describes the Wetzel mechanical stoker, which consists of a cast iron stoker front on the outside of which is arranged the coal hopper, driving mechanism and regulators, and on the inside a frame upon which are assembled the coking grate, main grate and dumping grate, arranged so as to provide the largest proportion of air space in the coking grate and gradually diminishing proportions of air space in the main grate and dumping grate. The three grates are inclined downwardly throughout their entire surface. The coal is fed into the hopper, from which it is automatically pushed to the dead plate and coking grates, from which, having been coked, it travels slowly down the main grate toward the dumping grate. The speed of the feeding mechanism can be regulated to suit the fuel. Views of batteries of stokers are given, the various parts of the machine are illustrated and described, and sectional views of the stoker applied to various types of boilers are included. Some views of power plants in which the stokers have been installed are also given.

Railroad Velocipedes.—Buda Foundry & Mfg. Company, Railway Exchange, Chicago, Ill. Bulletin No. 135. Shows a line of motor and hand or foot propelled velocipedes for the use of railroad employees in track inspection and other travelling along the tracks. Both the motor and manually propelled machines are made to carry one, two and three persons. Some are also arranged with trays to carry signal lamps, batteries, tools, &c.

Motor Driven Boring Mills.—Gisholt Machine Company, Madison, Wis. Page for loose leaf catalogue. Shows a motor driven 30-in. boring mill and a method of finishing jaws for Gisholt scroll chucks. Eighteen pieces bolted to a jig are being machined at the same time.

Gas Producers.—Westinghouse Machine Company, East Pittsburgh, Pa. Circular W. M. 503. Describes at considerable length double zone gas producers for bituminous fuels and gives the results of a number of tests made on them. *The Iron Age* June 17, 1909, contained an illustrated description of this type of producer.

Forgings.—Steel Car Forge Company, Pittsburgh, Pa. Catalogue, 6 x 9 in.; 128 pages; cloth binding. An especially complete presentation of the company's products. These include about everything in the way of forgings and pressed steel fittings required in the construction of railroad cars of all descriptions, in addition to special forgings and fittings for mine cars, underground railway cars, &c. A full line of bolts, nuts, rivets, &c., wrought iron washers and lag screws are illustrated and listed.

Electrical and Steam Machinery.—MacGovern, Archer & Co., 114-118 Liberty street, New York. Stock list of electrical and steam machinery, power house equipment, cars, &c., line of air compressors, motors and generators, boilers, cars and power equipment, both new and second hand.

Forging, Heating and Welding Furnaces.—Rockwell Furnace Company, 26 Cortlandt street, New York. Catalogue, 9 x 12 in.; 40 pages. This company makes a general line of furnaces for heating any material for forging, welding, &c., as well as special equipment for particular purposes. The catalogue shows a forging and dressing furnace, an adjustable top slot forge, brazing forges, accurate temperature forging furnaces, portable and stationary rivet heating furnaces, flue welding furnaces, portable heaters, blacksmith forges, large forging and heating furnaces, &c., adapted for the use of either oil or gas fuel. Particularly interesting are the large number of views showing the various kinds of apparatus in use. Oil burners, steel fan pressure blowers, fuel oil pumping systems, regulating valves, pressure gauges, &c., are briefly referred to in conclusion.

Electrical Equipment.—General Electric Company, Schenectady, N. Y. Thirteen bulletins covering the following subject matter: No. 4676, various types of enclosed arc lamps for interior illumination; No. 4677, data relative to the Sprague-General Electric type M system of control; No. 4681, all the panel boards designed by the company; No. 4682, the use

of oil break switches for spinning frames and machine tools; No. 4687, superseding No. 4532, direct current motor starting rheostats; No. 4691, small polyphase motors for machine drive; Nos. 4692 and 4693, the latest types of railway motors; No. 4694, superseding No. 4422, portable substations for electric railways, consisting of specially arranged cars containing complete substation equipment to provide for a temporary supply of power; No. 4698, superseding No. 4579, luminous arc headlights; No. 4699, superseding No. 4444, motor driven air compressors; No. 4700, superseding No. 4429, electric switchboard instruments, type R2; and No. 4701, superseding No. 4467, an emergency straight air brake system.

Crank Shaper Drives.—Reliance Electric & Engineering Company, Cleveland, Ohio. Bulletin No. 101. Compares by graphical analysis the relative merits of three different methods of varying the number of cutting strokes of a shaper per minute—namely, by the use of cone pulleys, speed boxes and variable speed motors. Tables are given showing the power required to drive shapers under different conditions of work, and the booklet is intended to serve as a guide in converting belt driven to motor driven machines and to give the users of the machine an idea of the proper drive necessary to its operation. The Lincoln variable speed motor for shaper drive, which is made by the company, is taken up briefly and its advantages are explained.

Gear Grinders.—Gear Grinding Machine Company, Detroit, Mich. Folder. Shows a type A Ward gear grinder, which, it is claimed, will grind a gear to within less than 1-1000 in. of absolute accuracy. This grinder, in addition to finishing a gear, does away with the second or finishing cut ordinarily made with a gear cutter. It will evolve from a rough tooth casting a complete gear. Its operation is fully described in the circular.

Iron and Steel Protection.—Glidden Varnish Company, Cleveland, Ohio. Booklet. Presents the merits of an acid proof coating which is a preservative finish for iron and steel. This coating is used in connection with a graphite coating made by the company. The acid proof coating is first used as a priming coat, after which the graphite acid proof coating is applied, and the acid proof coating is again used as a finishing coat. It also can be used as a thinning substance for pigmented paste and preservative coatings, such as zinc, lead, graphite, &c. A photographic reproduction of a piece of sheet iron to a section of which the coating was applied previous to submitting it to a bath of 30 per cent. nitric acid for 1 hour and 40 minutes is shown. The unprotected portion of the metal was consumed by the acid, while the part that had been treated remained intact.

Leavitt's Alloys.—C. W. Leavitt & Co., 30 Church street, New York. Circulars calling attention to various matters. One treats of the ores, metals and alloys for which the firm is selling agents; another has reference to the Girod electric furnace, for which the firm is the American agent; a third calls special attention to the advantages of the use of silicon-manganese-aluminum alloy as a deoxidizing agent.

Hauling Engines and Road Rollers.—Monarch Road Roller Company, 114 Liberty street, New York. Two bulletins. A hauling engine of 30 hp. which has two road speeds and a power steering device and which will pull 125 tons on a level road is illustrated, and space is given to stone crushers and road rollers which are built along powerful lines but do not appear cumbersome. The second bulletin describes the latest model steam roller, which has an increased coal and water carrying capacity and larger rolls than the company's old type.

Gas and Gasoline Engines and Soldering Furnaces.—Jacobson Machine Mfg. Company, 676 Marietta street, Atlanta, Ga. Three bulletins and circular. Bulletin No. 27 is devoted to stationary and portable gas and gasoline engines with the hit-and-miss type of governing. Line drawings of a standard engine are shown and its various parts are taken up separately and described. An automatic gas and gasoline engine is shown and the automatic valve gear is described with the aid of an outline drawing. Portable engines mounted on trucks and semi-portable plants are included. No. 28 treats particularly of gas and gasoline engines used for electric lighting purposes, and a general line of equipment of this character is described. No. 29 treats of gasoline power sprayers and contains interesting views of them in use. The circular shows a new gas soldering furnace adaptable for using natural, illuminating or producer gas.

Punching and Shearing Machinery.—Rock River Machine Tool Company, Janesville, Wis. Catalogue D, 6 x 9 in., 53 pages. The Badger line of machine tools for working plates, bars and structural material, including punching and shearing machinery, bulldozers, bending and straightening rolls, rotary shears and punches, &c., is listed here, and the more important equipment is illustrated and specifications are given.

Portable Electric Drills, Reamers and Grinders.—S. Obermayer Company, Cincinnati, Ohio. Catalogue, 6¼ x 9¼ in., 43 pages. The Peerless line of electric portable tools is described and views of them in operation are included. An electric portable chipping hammer and portable electric drills, which are described as simple and of durable construction, are shown at work and a line of air-cooled portable breast drills and drills

and reamers are described, together with several types of small grinders, including an aerial buffer and grinder and a portable grinder with a 12-in. extension for internal grinding on cylinders. Small electric blowers and air-cooled motors are also shown.

Grates.—Washburn & Granger, 120 Liberty street, New York. Catalogue B. A line of tumbling, shaking and stationary grates are shown and attention is called to special grates adaptable for the burning of smaller sizes of anthracite, such as buckwheat and rice coal.

Annealing and Hardening Furnaces.—W. S. Rockwell Company, 50 Church street, New York. Folder. Describes in a general way a line of annealing and hardening furnaces which are made with chambers up to 39 in. wide. These furnaces can be heated with either oil or gas fuel, and a standard furnace is shown assembled and sectional views are included.

Gas Engines.—Capital Gas Engine Company, West Twenty-first street and Belt Railroad, Indianapolis, Ind. Loose leaves assembled in specification form showing the line of Gem gas engines for users of small power. A 2-hp. engine weighing 425 lb. is described with the aid of three views. This is a four-stroke engine, and descriptions for its operation are given.

Grinding Equipment.—Norton Company, Worcester, Mass. Booklet—"Facts Worth Knowing About Grinding Wheels." Contains information about grinding wheels, including a description of the material used in their construction and the methods employed by the company in manufacturing. Tables for selecting grades of wheels for different work are given, together with rules for obtaining surface speeds and like information.

Small Tools.—Pratt & Whitney Company, Hartford, Conn. Catalogue No. 5, 5 x 7½ in., 235 pages. This catalogue, issued by the small tool department of the company, supersedes all previous editions, and is divided into sections dealing with taps, dies, milling cutters, reamers, punches, drills and miscellaneous tools. New tools shown in this edition include hand taps with additional pitches in U. S. form of thread; A. L. A. M. standard taps; round split dies, adjustable blade chucking reamers; high speed metric international and French standard taps; A. S. M. E. standard machine screw taps; threaded spindle stay-bolt taps; round split dies, A. S. M. E. standard; adjustable blade chucking reamers; special taper roughing reamers; high speed twisted drills with Morse taper shanks (described in *The Iron Age* August 12, 1909); triple head knurling tool holder; hollow mill for test piece, and milling hobs for roll thread dies. The index includes a list of illustrations and is otherwise carefully gotten up. Useful tables relating to the handling of machine tool attachments, &c., are given.

Machine Tools.—Miami Valley Machine Tool Company, Dayton, Ohio. Catalogue F. This is in loose leaf form and shows new types of 13 and 16 in. standard engine lathes and 12 and 14 in. sensitive drills recently brought out. Through a system of jigs and templates all parts of the lathes are interchangeable. Machines mentioned are shown with their equipment, and views are given of a cutter and reamer grinder, universal grinder and other machine tool equipment, together with the operations some of them can perform. Instructions for setting grinders are included.

Metal Alloys and Fluxes.—United States Alloys Company, Curtis Bay, Md. Folder. Calls attention to the company's line of fluxes for all melting requirements of brass foundries. The company makes special alloys to order, and the folder calls attention to two of its fluxes adaptable for using scrap of previous melts.

Pumps.—Du Bois Iron Works, Du Bois, Pa. Bulletin E P No. 3. Shows some of the company's line of pumps, including a motor driven pump with automatic electric starter, a vertical gasoline engine driven pump, horizontal gasoline engine pumping outfit and a pump of the belted type. The company manufactures pumping equipment with capacities of from 25 to 1600 gal. per min.

The Industry Bonus in Indiana.—At the recent meeting the Federated Commercial Clubs of Indiana, at Gary, plans were discussed for investigation of the merits of industries offering themselves for bonuses, or seeking locations in the various cities of the State. The secretary of the Commercial Club of one of the chief manufacturing cities said that of 500 industries that sought locations in that city, only 2 per cent. were found desirable. The offering of bonuses was also an important question considered at the meeting. The majority of the delegates leaned to the belief that the practice was not a good one and said that the selection of a city by an industry should be made because of its advantages rather than the amount of money the city is able to offer as a bonus. Those that favored bonuses maintained that if an industry was worth a bonus it should have it; that the city would get back its money many times in increased valuations.

The American Electrochemical Society's Meeting.

The autumn meeting of the American Electrochemical Society will be held in New York City from October 28 to 30. It will be opened by a professional meeting in the Chemists' Club in the afternoon of the first day. The morning and afternoon of the third day, two sessions devoted to the reading and discussion of papers, will be held at Columbia University. The whole of the second day will be devoted to an excursion to Bayonne, N. J. Members and guests (without ladies) will meet in the waiting room of the station of the Central Railroad of New Jersey in Jersey City at 8.30 a.m. So far the following companies have given permission to visit their plants: Standard Oil Company, National Sulphur Company, Pacific Coast Borax Company, Grondal Briquetting plant at the works of the General Chemical Company, Babcock & Wilcox Company, Electro Dynamic Company, Electric Launch Company, Industrial Oxygen Company. It is to be clearly understood that while the above named companies have given permission to the society as a whole to visit their works, members interested in a competitive process are expected not to visit that particular plant. In the evening of the second day a banquet will be held at the Hotel Cumberland. On the evening of the last day the society will be the guest of the New York Chemists' Club at a smoker in the club house.

Dr. Leo H. Baekeland is president of the society, and Dr. J. W. Richards, Lehigh University, South Bethlehem, Pa., is the secretary.

Shipbuilding in Canada.

TORONTO, October 9, 1909.—Upon his return to Canada from attendance at the Imperial Defense Conference in London last month, Hon. L. P. Brodeur intimated that he had had overtures from certain British shipbuilding firms for the financing of ship constructing yards on the Atlantic and Pacific coasts of Canada, yards in which vessels for the proposed Canadian navy could be built. He expressed the opinion that the assistance of such concerns would be needed. A report has since been put in circulation at Ottawa, that Harland & Wolff, the Belfast firm, are to establish a plant in Canada for building warships. This report has not been confirmed. Another story is to the effect that a Canadian firm would be formed, for the most part, of Montreal men, prominent in shipping and commercial circles. Sir Montagu Allan, when interviewed on the subject, stated that the project was being discussed, but that nothing definite had been done yet.

Unquestionably, the principal business of the next session of the Dominion Parliament, opening in November, will be in pursuance of the Ministers' report of the Defense Conference. A naval programme will be presented by the Government, and the question of aiding the shipbuilding industry will be taken up and probably disposed of.

C. A. C. J.

The Niles Forge & Mfg. Company, Niles, Ohio, is completing a new plant which is expected to be in operation this month. The main building is 60 x 160 ft., of steel construction, the power plant being located at one end. It is being fitted with air hoists, jib cranes, bulldozers, steam hammers, heavy punch and shears, machine tools, furnace, &c., for the manufacture of forgings for galvanizing plants, such as housings and galvanizing rolls, hot mill screws and screw boxes, sheet mill tongs, standard hitchings and coke scraper heads. Other work will include sheet and tin mill annealing boxes, galvanizing pots and general tank work, steel industrial cars, coal mine screening equipment, &c.

An Ashtabula, Ohio, dispatch of October 4 reports rapid work by four new Hulett machines installed there. From the steamer George W. Perkins, 10,300 tons of ore was unloaded in six hours, or 440 tons an hour for each machine, including the time of cleaning up.

NEWS OF THE WORKS.

Iron and Steel.

The blast furnace of the Jefferson Iron Company, Jefferson, Texas, was scheduled to blow in October 8. Coke will be used as fuel.

It was erroneously stated in these columns September 30 that the Danvers Iron Works, Danvers, Mass., is now occupying its new fireproof foundry. The plant which replaces the one destroyed by fire some time ago is not a foundry but a rolling mill, and consists of several buildings equipped for the production of wrought iron spikes, railroad ties, rods and similar products.

The sale of the Passaic Steel Works, Patterson, N. J., to former Mayor Lawrence Fagan of Hoboken for \$190,000 has been set aside by the court, and the plant will be resold at public sale November 12. The lowest price to be accepted at the sale is \$250,000, and the bondholders are bound by bonds to purchase the works at that figure if the bidding goes no higher.

The Detroit Seamless Steel Tubes Company, Detroit, Mich., is erecting a large addition to its factory and installing additional equipment which will increase its capacity about 30 per cent. This is made necessary by the rapidly increasing demand for Detroit locomotive flues and mechanical tubing.

The Forged Steel Wheel Company, a subsidiary interest of the Standard Steel Car Company of Pittsburgh, which is to build an open hearth steel plant at Butler, Pa., has placed contracts through Julian Kennedy, consulting engineer, Pittsburgh, for practically all the equipment for the plant. To the Morgan Engineering Company, Alliance, Ohio, has been given a contract for the 34-in. universal slabbing mill, with tables and auxiliary equipment, including tongs, cranes, stripper and floor-charging machines. Seven cranes of 60 tons capacity and smaller will be a part of the equipment. The contract for the main power engine for the plant was awarded to Mackintosh, Hemphill & Co., Pittsburgh. All machinery is to be installed so that the plant will be ready for operation April 1, 1910.

Hannah Furnace of the Republic Iron & Steel Company, at Youngstown, Ohio, has been blown out for repairs.

The West Penn Steel Company, Pittsburgh, has awarded a contract to the United Engineering & Foundry Company, Pittsburgh, for an additional sheet mill, including roughing and finishing stands, to be installed in its new plant at Brackenridge, Pa. The company is just about to begin operations in its plant, which is practically completed.

Geo. J. Hogan, constructing engineer, People's Bank Building, Pittsburgh, has a number of important contracts on hand, among which are the construction of three gas producers and three double annealing furnaces for the Thomas Steel Company, Niles, Ohio; one annealing furnace for the Warren Sheet & Iron Company, Warren, Ohio, and two faggot heating furnaces in connection with which will be erected two waste heat Wicks boilers for the Sligo Iron & Steel Company, Conneville, Pa. Other furnaces in the plant are being repaired, and operations will be resumed about November 1. Mr. Hogan has also about completed the construction of open hearth furnace No. 2 for the Huron Iron & Steel Company, Norwalk, Ohio, which will be put in operation as soon as it is finished.

The Iron & Steel Products Company, 80 Broadway, New York, is operating its Baltimore, Md., Bristol and Lebanon, Pa., rolling mills and chain works full. The company recently booked United States Government orders for about 1000 tons of high grade chains for Panama buoys and light vessel uses.

The Standard Tin Plate Company, Canonsburg, Pa., has increased its capital stock from \$300,000 to \$500,000.

General Machinery.

Benton Harbor, Mich., is considering the construction of a modern system of pumping and water supply similar to those of the principal cities across the lake, and it will probably be in the market next spring for an engine of 8,000,000 to 12,000,000 gal. capacity. It is reported that plans are being prepared by A. T. Maltby, municipal engineering expert, whose office is in Chicago.

The town authorities, Peabody, Mass., have decided upon the installation of a horizontal pumping engine of 5,000,000 gal. capacity. Considerable additional apparatus will also be required for the water works system.

A high pressure water system for fire protection, with motor driven centrifugal pumping stations similar to those built by the city of New York, is contemplated at Joliet, Ill. Plans are now being drawn and various engineering features discussed.

The Lehigh Clutch Company has been organized at Catawqua, Pa., by R. P. Kohler, and will build or lease a factory. The machinery requirements have not yet been fully determined upon.

The Klauder-Weldon Dyeing Machine Company, Amsterdam, N. Y., will rebuild the part of its plant recently destroyed by fire. The equipment for the new structure has been secured.

Three multi-stage turbine pumps of large capacity are to be installed in December by the Lake Superior Corporation, Sault Ste. Marie, Ont.

The pumping machinery for water works at Bellingham, Wash., recently referred to, will not be bought until January or February, 1910, and the authorities are undecided whether to install steam, gas or electrically driven pumps.

A tube mill will be added to the plant of the Dexter Portland Cement Company, Nazareth, Pa.

A complete rock crushing plant, with two gyratory breakers, elevators, revolving screens, &c., will be installed by the San Antonio Crushed Stone Company, San Antonio, Texas.

A new pumping station will be built and equipped by Ocean City, Md., to replace the plant which was recently burned.

The Sedro-Woolley Iron Works, Sedro-Woolley, Wash., will replace the buildings recently destroyed by fire with a machine shop, 60 x 100 ft.; foundry, 60 x 100 ft.; pattern shop, 30 x 50 ft.; pattern storage room, 35 x 70 ft.; warehouse, 40 x 64 ft.; office building and supply department, 24 x 80 ft. The buildings will be of slow burning construction and will be equipped with modern tools throughout.

The Pittsburgh office of the Laidlaw-Dunn-Gordon Company has been awarded a contract for installing a two-stage air compressor, with 16 x 25 x 25 x 15 in. cylinders and 18-in. stroke, for the Taylor Coal & Coke Company at Losphos, Pa.

The machinery department of the Cincinnati Iron & Steel Company, Cincinnati, Ohio, is operating its Nugent clutch factory with a full force, and commencing with October 4, running nights with the same complement of hands.

The Steel Storage & Elevator Construction Company, Buffalo, N. Y., has received contract for the erection of a 1,000,000-bushel grain elevator at Michigan and Ganson streets and the Buffalo River for the Spencer Kellogg Company, linseed oil producer. The structure will be 56 x 285 ft., 155 ft. high, of structural steel, with reinforced concrete bins, and will cost, with equipment, \$275,000. The company is in the market for a complete outfit of grain conveying and elevating machinery and electric power equipment.

Foundries.

The Enterprise Brass Works, Muskegon, Mich., manufacturer of brass, bronze and aluminum castings, is contemplating a new foundry 48 x 128 ft., of white brick, with cement floor and steel roof. This will more than double the present capacity of the plant.

A new addition is being made to the plant of the Ideal Foundry Company, Grand Rapids, Mich., to take care of its increasing business.

A pattern storage building, 40 x 42 ft., is being constructed as an adjunct to the plant of the Wisconsin Foundry Company, Milwaukee, Wis., maker of gray iron and brass castings.

The warehouse of the Superior Foundry Company in which was stored finished piano plates was destroyed by fire September 4. Rebuilding has already commenced and the burned structure will be replaced by one of fireproof construction. All other departments are running as usual and shipments will only be delayed a few days, as the loss was entirely in finished piano plates.

The Titchener-Culver Iron Company, Binghamton, N. Y., is to erect a new foundry building of concrete to cost about \$4300. This building is to be used in place of the one destroyed by fire last May, since which time the company has been carrying on its business in a small building which it owned at West Oneonta. About the only equipment required will be a cupola and crane.

Mayor George Pierson of Dover, N. J., and associates have leased the Sims-Kent foundry on Salem street to the Aluminum Company of America.

The Toledo Steel Casting Company, Toledo, Ohio, a new concern, will be equipped to supply industrial and railroad castings up to 20,000 lb. A large amount of new machinery is being installed and in the near future a building is to be constructed, 69 x 204 ft., with a lean-to 50 ft. wide the full length of the building. The company now controls the business formerly conducted by the C. E. Sutton Company and reports considerable business ahead, with future prospects bright. The officers are as follows: S. D. Carr, president; Thomas F. Meek, vice-president and general manager; A. A. Barber, secretary and treasurer. Mr. Meek was formerly manager of sales and general superintendent of the Detroit Steel Casting Company.

The Clarage Foundry & Machine Company, Kalamazoo, Mich., is having plans prepared for a foundry and machine shop with 30,000 sq. ft. of floor space, which it will erect on Pitcher street.

The Pratt & Letchworth Company, manufacturer of malleable iron and steel castings, Buffalo, N. Y., is adding a one-story steel and concrete molding building to its plant at Tonawanda and Amherst streets.

The Riverview Bronze & Mfg. Company, recently incorporated at Buffalo, N. Y., will build a foundry and two-story factory, 50 x 96 x 30 ft. and 50 x 60 x 30 ft., of structural steel and corrugated iron, at Gull street and the New York Central Railroad Belt Line. The plant will be equipped for the manufacture of aluminum and brass castings and specialties for automobiles and motor boats.

Power Plant Equipment.

Two large dynamos and from 50 to 75 alternating current motors will be required for the new plant of the Starr Mfg. Company, Carpenterville, Ill., together with considerable special machinery. The prime mover is to be a hydraulic turbine.

The Rensselaer Falls Electric Light & Power Company, Rensselaer Falls, N. Y., will be in the market this fall for transformers and other substation apparatus with which to equip its new power distribution system to supply De Kalb Junction and intermediate points.

Two large compound engines and electrical machinery will be installed this winter in the power plant of the Tompkins Cove (N. Y.) Stone Company.

H. M. Byllesby & Co., Chicago, have acquired the electric power and lighting station and gas works at El Reno, Okla., both of which are to be practically remodeled and equipped with machinery of greater capacity.

The Carrollton Electric Company, Carrollton, N. Y., has been organized to build and operate a power plant.

Four mammoth transformers of 1500 kw. each will be installed this winter by the Pacific Gas & Electric Company, San Francisco, to receive high potential current from its transmission system and reduce it to commercial voltage.

The Ione Water & Light Company, Ione, Wash., will establish a substation at Colville, Wash. The plans call for considerable new apparatus.

Ferris Bros., Watertown, S. D., are reported to be in the market for an engine and generator. They control the local lighting plant.

A municipal plant for electric lighting will be built in the spring at Ramona, S. D., if present plans are carried through.

A hydro-electric plant to develop 1000 to 1200 hp. will be constructed this winter by the Paulding County Power Company, Dallas, Ga.

The ratepayers of the village of Morrisburg, Canada, voted almost unanimously for the by-law authorizing the lease of the municipal hydro-electric power plant for 60 years to the Canadian Sheet Steel Corporation.

Another hydro-electric project of importance to the industrial future of the Pacific Northwest is under development by the Rainier Power & Irrigation Company, Seattle, Wash., which has plans on foot for the construction of power plants at Winthrop, Twist and the Black Canyon on the Methow River, with transmission lines running west along the Columbia River to the coast cities. If this ambitious undertaking is successfully carried through it will mean not only the installation of several large hydraulic turbine units, but also the purchase of numerous transformers, motors and other electrical apparatus by power users through a wide stretch of country.

Bids will be received until October 21 by the Park Board, New York, for a light and power plant for the New York Public Library, Fifth avenue, Forty-first and Forty-second streets.

An 18 x 30 in. Corliss engine, for belting to an electric dynamo, will be added to the generating station of the Oxford Junction (Iowa) Light, Power & Mill Company.

Construction work will be begun this season by the Paris & Northern Traction Company, Danville, Ill., on a new line about 30 miles in length to reach the tracks of the Terre Haute & Western Railroad at Paris, Ill. This will necessitate additional power machinery, rotary converters or motor generators, transformers, motors, &c., as well as rails and overhead material.

Two generators for engine drive, which will be among the largest of that type to be put in service, are under contract for the power plant of the Lake Superior Iron & Steel Company, Sault Ste. Marie, Ont.

The Rosiclare Lead & Fluorspar Company, Rosiclare, Ill., will install one or two electric motors of large capacity for operating machinery in its works.

The McKeesport Tin Plate Company, McKeesport, Pa., will put in an extensive line of direct current motors for electric drive and an engine and dynamo of 400 to 500 hp. to generate the power required in operating them.

Two steam turbines and turbo-generators of 1000 hp. each will be installed in the Eastern quarries of the Casparis Stone Company, Columbus, Ohio, which is understood to have purchased two gyratory breakers of the largest known size, capable of reducing about 1000 tons of rock per hour. Considerable auxiliary machinery will also be needed.

The Eastern Pennsylvania Power Company, Columbia, N. J., has negotiated the purchase of turbines and generators for a large hydro-electrical power development. Additional apparatus will be ordered later.

A boiler, engine, generator and electric motors will be required by the Ketten Laundry Company for a new building at Chardon, Iowa.

A Corliss engine or steam turbine and dynamo will be purchased next month for the municipal power plant at Galveston, Texas. Proposals recently made were rejected.

The Interurban Electric Company, Cartersville, Ind., which

was recently organized to furnish electric power to surrounding communities, has plans for the purchase of a local plant and installing a new generating unit, probably steam turbine, of 400 to 500 hp.

The city of Helena, Mont., is now in the market for an electric generating unit and subsidiary apparatus with which to equip the municipal power plant recently decided upon.

A municipal power and lighting station is to be constructed at Taloga, Okla. Machinery will be bought in December.

The Tonino Light, Power & Water Company, Olympia, Wash., is having plans drawn for a hydro-electric power development on the Skookumchuck River. Turbines and generators of large capacity are to be installed.

Bridges and Buildings.

The Burke & Durbin Company has been organized at Anderson, Ind., with a capital stock of \$10,000, to do a general construction business. The incorporators are David H. Durbin, Lee Burke and Edward Burke.

Hardware.

The St. Charles Net & Hammock Company, St. Charles, Ill., is arranging to erect a two-story brick factory building.

Fires.

The plant of the Hartford Plow Company, Hartford, Wis., was burned September 25, the loss being about \$30,000.

Miscellaneous.

Bonds have been voted by the city of Dayton, Wyo., providing funds for the erection of a water works system.

A company has been formed at Portland, Ore., under the name of the Mac-ite Fireproofing Company, with a capital stock of \$100,000, to operate a plant for the manufacture of Mac-ite, a fireproofing material composed largely of gypsum brought from Alaska. The plant will be established in two large buildings covering a quarter of a block, the machinery for which is now being installed.

Besides the building now nearing completion as an extension of the plant of the K. H. Wheel Company, Detroit, Mich., another addition is proposed, plans for which are in course of preparation.

The Irondale Steel Company, Fort Townsend, Wash., has just placed a contract with Tate, Jones & Co., Inc., Pittsburgh, Pa., for the complete oil burning equipment for the two 20-ton open hearth furnaces. The contract includes the burners, pumping systems, ladle driers, &c.

The part of the plant of the Parkhurst Elevator Company, Peru, Ind., which was recently burned, has been rebuilt and was placed in operation October 11.

The E. I. du Pont de Nemours Power Company, Wilmington, Del., intends to erect a wood alcohol plant at Georgetown, S. C., the equipment to be furnished by the Wood Waste Products Company.

The International Acheson Graphite Company, Niagara Falls, N. Y., will add another very substantial and commodious building to its branch works at Niagara Falls, Ont. The structure, for which a contract has been awarded, is to be 50 x 105 ft. The facilities afforded by this addition will make the Canadian works of the Graphite Company quite complete in its ability to care for a rapidly growing trade, made so by Canada's industrial progress. The building will contain a new grinding plant, in which the lubricating, electrotypes and other grades of powdered graphite will be prepared for market. It will also contain a stock room for package goods, such as graphited greases, powders, &c., while a new shipping room will make it most convenient for promptly filling orders.

The Wheeling Enameled Iron Company, manufacturer of bathtubs and sanitary ware, Elm Grove, W. Va., has awarded a contract to the John Eichleay, Jr., Company, Pittsburgh, for remodeling the foundry building and making a number of other improvements to the plant. The roof of the foundry, 70 x 200 ft., will be elevated and runways installed for traveling electric cranes. A contract has been placed with the Niles-Bement-Pond Company for two 5-ton cranes. Schreiber, Johnson & Risacher, Pittsburgh, engineers, have been awarded the contract for installing a sand handling plant of modern design, and the castings for this part of the equipment will be made by the Scottsdale Foundry & Machine Company, Scottsdale, Pa. A gas engine of 150 hp. will be installed in the power plant and considerable additional equipment will be placed in other departments. Samuel E. Duff and Gulick, Henderson & Co., Pittsburgh, are consulting engineers.

Improvements of considerable extent will be made to the water works at Coleman, Texas, including probably the purchase of a new pumping unit.

The pumping plant at Weston, Ore., will probably be enlarged this winter to provide for extensions contemplated in the water works system.

The France Company, Bloomville, Ohio, has decided upon the installation of a magnetic separator.

Among the communities for which small pumping units will probably be required during the year are Newberry, S. C.; Her-

ington, Kan.; Washington, La.; Springville, Utah; Hebron, Neb.; Monroe, Mich.; Pike, N. Y.; Warsaw, N. Y.; Okeene, Okla.; Herrick, S. D.; Sultan, Wash.; Ashland, Ore.; Walbach, Neb.; Winnfield, La. In each of these plans for new or larger water systems are being matured and may reach the purchasing stage shortly.

A timber treating plant similar to that of the Atchison, Topeka and Santa Fé Railroad at Somerville, Texas, will be erected by the National Lumber Creosoting Company, Texarkana, Ark., involving the purchase of a large amount of apparatus, including cylinders, cars, ralls, pumps, compressors and power machinery.

Recent sales by the Pittsburgh Gage & Supply Company, Pittsburgh, of White Star oil filters and continuous oiling systems include among others the Indiana Steel Company, Gary, Ind.; Republic Iron & Steel Company, Youngstown, Ohio; Forstman & Huffman Company, Passaic, N. J.; Barr Clay Company, Streator, Ill.; Buckeye Engine Company, Salem, Ohio; Peterson Engineering Company, New York; Platt Iron Works Company, Dayton, Ohio; Gloucester Electric Company, Gloucester, Mass.; De Forest Sheet & Tin Plate Company, Niles, Ohio; American Sintering Company, Hubbard, Ohio; Brown Engineering Company, Reading, Pa.; Acme Coal Mining Company, Greensburg, Pa.; American Iron & Steel Mfg. Company, Reading, Pa.; Majestic Collieries Company, Huntington, W. Va. The steel industries are well represented in this list. The important equipment now being furnished the Gary Works of the Indiana Steel Company makes the second large White Star oiling system installed in the world's largest steel mills. Orders for pipe equipment recently taken by the Pittsburgh Gage & Supply Company include the Gulf Smokeless Coal Company, Gulf, W. Va.; Wilson Coal & Coke Company, Logan, W. Va.; Monitor Coal & Coke Company, Logan, W. Va.; Yuma Coal & Coke Company, Logan, W. Va.; Bottom Creek Coal & Coke Company, Vivian, W. Va.; Eureka Coal & Coke Company, Echman, W. Va.

The Niagara Pulp Board Company, Niagara Falls, N. Y., will build and equip a plant at Walnut avenue and the New York Central Railroad. Contract has been let for two one-story buildings to cost \$25,000.

The Fraser Lock Bar Pipe Company, 50 Church street, New York, has elected the following directors: John Fraser, C. J. McDowall, George P. Bard, R. T. McCormick and A. W. Krouse. They elected C. J. McDowall president, John Fraser vice-president and A. W. Krouse secretary and treasurer.

The name of the Snyder & Baker Stove Works, Belleville, Ill., has been changed to the Baker Stove Works. The announcement made in some reports of a decrease in its capital stock is incorrect, no such change having been made.

The American Separator Company, Bainbridge, N. Y., in order to secure more room to take care of its increasing business, is to construct a concrete basement under the main building which will be used principally for storing, chipping and grinding castings. Some machinery has been ordered from the Brown & Sharpe Mfg. Company, Providence, R. I., which will be about all that will be required to balance the equipment, with the exception possibly of one or two drill presses.

The Kensington all steel journal box, made by the Union Spring & Mfg. Company, Pittsburgh, has been specified for use on the following equipment: 2600 coke cars, Pennsylvania Lines West; 2450 freight cars, Pennsylvania Railroad; 2500 coal cars, Chesapeake & Ohio Railroad; 300 coal cars (to be built at the Roanoke shops), Norfolk & Western Railroad; 120 cars, Vandalia Railroad; 140 cars, Grand Rapids & Indiana Railroad, and 250 flat cars, Western Pacific Railroad.

The Pilot Motor Car Company has been incorporated at Richmond, Ind., with \$100,000 capital stock, to manufacture automobiles. The directors are George E. Seidel, Clarence H. Kramer and Horace M. Kramer.

The Fort Wayne Brass Works has been incorporated at Fort Wayne, Ind., with \$15,000 capital stock, to manufacture brass goods. The directors are Maurice Goldberger, J. H. Mandeville and William J. Vesey.

The Indiana Radiator Company has been incorporated at Walkerton, Ind., with a capital stock of \$30,000, to manufacture and sell radiators, sash weights, &c. The incorporators are Dixon W. Place, Timothy Holland and Charles B. Bently.

The Overland Automobile Company, Indianapolis, Ind., has changed its name to the Willys-Overland Company, the capital stock being increased from \$500,000 to \$1,500,000, because of the purchase of the Pope-Toledo automobile plants at Toledo, Ohio, and Indianapolis, Ind. The company will manufacture 20,000 automobiles during the season of 1910.

The Coesir Rim & Tire Company has been incorporated at Indianapolis, Ind., with \$100,000 capital stock, to manufacture rims and tires for automobiles. The incorporators are John L. Coesir, the inventor of a clincher tire; George T. Fish, Edward S. Bertsch and Oscar Herman.

The new plant which the Hayes Run Fire Brick Company is erecting at Orviston, Pa., to replace the structure destroyed by fire, is progressing satisfactorily and will soon be placed in operation. The new building is 70 x 300 ft., two stories, of steel and brick construction, and as near fireproof as possible. C. W.

Keller, general manager of the company, reports that its property contains what is considered the very finest fire clay in the country, and the new plant will not only be one of the most modern, but its output will consist of special brands of high grade firebrick, on which the company has an established trade.

The Gould Storage Battery Company, Depew, N. Y., has received contract for and is now installing the regulating battery equipment for the electrical operation of the Detroit River tunnel, at Detroit, Mich., which has just been completed by the Michigan Central Railroad. This electric battery plant, which is one of the largest and most modern in the country, will consist of 312 cells, having a present capacity of 1500 kw. per hour, with an ultimate capacity of 2300 kw. per hour.

The Mansfield Steel & Wire Company is a new industry for Mansfield, Ohio. The company will manufacture automatic drive gates and other utilities. The incorporators are M. A. Blackburn, Huntington Brown, Peter A. Biddinger, Arnold Kallmer-ton and Arthur Hughes.

The Franklin Coke Company organized at Uniontown, Pa., recently by electing the following officers: James S. Braddock, W. M. Sheppard of Mount Pleasant, George W. Wilson of Pittsburgh, Paul Mauzy of Connellsville, Dr. George Roberts of Vanderbilt, Christian and W. H. Echard, Frank Dey, O. E. Hibbs, Joseph M. Bates and William J. Dickson of Uniontown. The officers chosen are James S. Braddock, president; Paul Mauzy, treasurer; Charles Kendall, secretary. The company has a capital of \$60,000, and a charter has been granted. A plant of 40 ovens is in course of construction and will be ready for operation November 15.

The Blair Engineering Company, New York and Chicago, has taken a contract from the Portsmouth Steel Company, Portsmouth, Ohio, for Blair ports for eight of the latter's open hearth furnaces.

The Standard Boiler & Plate Iron Company, Niles, Ohio, is erecting a 125 x 160 ft. steel addition to its plant, which will be in operation about October 20, and will about double the floor space of its erecting shop. The company manufactures car tanks, oil tanks, oil refineries, &c., and is operating its plant day and night.

The Petroleum Iron Works Company, works at Sharon, Pa., and offices in the Farmers' Bank Building, Pittsburgh, is operating its plant full time. Among contracts under way and in course of construction are a number of 60,000-bbl. oil tanks to be shipped to the Isle of Trinidad; stand pipe, 24 x 100 ft., for the McKeesport Tin Plate Company, McKeesport, Pa.; self-supporting steel stack, 6 x 165 ft., Page Woven Wire Fence Company, Monessen, Pa.; 250,000-gal. water tank, Pittsburgh & Lake Erie Railroad at Buena Vista, Pa.; number of 37,000 and 55,000 bbl. crude oil tanks to be shipped to Baltimore, Oklahoma and points in Illinois, and several riveted tanks, to be shipped to Mexico.

The Buffalo Weaving & Belting Company, Buffalo, N. Y., is adding a two-story building, 50 x 150 ft., to its plant on Chandler street and the New York Central Belt Line.

The Everett-Metzger-Flanders Company, Detroit, Mich., has let contract for additions to its automobile manufacturing plant at Jefferson and Clark avenues, to cost over \$100,000, comprising four-story buildings, 56 x 460 ft., 56 x 200 ft., and 26 x 30 ft.; two-story building, 30 x 100 ft., and one-story buildings, 70 x 230 ft. and 30 x 100 ft.; also a new power house, 100 x 120 ft., 50 ft. in height.

The American Body Company, manufacturer of automobile bodies, Buffalo, N. Y., is building a two-story brick addition to its plant at 1257 to 1261 Niagara street.

The Jacob Dold Packing Company, Buffalo, N. Y., is building a steel and frame car repair shop at its plant on Howard street and the New York Central Railroad.

The M. D. Hubbard Spring Works, Pontiac, Mich., will build a two-story concrete block factory building, 40 x 80 ft.

The addition which the Pierce Arrow Motor Car Company is to make to its plant at Elmwood avenue and the New York Central Belt Line, Buffalo, N. Y., will be 60 x 700 ft., three stories and basement, of structural steel and brick, with concrete floors and roof.

Negotiations have been completed between the Commercial Club of Peru, Ind., and the Salisbury Auto Wheel Company, Jamestown, N. Y., by which the latter will establish a plant at Peru, in the factory buildings formerly occupied by the Brownell-Booth Works. The company is to invest \$40,000 and has orders aggregating \$300,000. About \$60,000, raised in stock subscriptions by the club, will be turned over to the company.

The Peru Auto Parts Company, Peru, Ind., has been incorporated with a capital stock of \$200,000, to manufacture all kinds of automobile parts, &c. The incorporators are S. H. Penningfield, Benjamin S. Dean, E. D. Shearman.

The G. & J. Tire Company, Indianapolis, Ind., after having built three large new additions to its factory in the last 10 months, is preparing to build a fourth addition, to be completed before the rush season starts next spring.

The Speed Changing Pulley Company, Anderson, Ind., has changed its name to the De Tumble Motors Company.

The Iron and Metal Trades

A Scarcity of Raw Material.

Heavy Buying of Pig Iron and Steel.

The very heavy volume of orders which is being placed with the steel works is reflected in further buying of raw material by some of the leading independent works. In the middle of last week the Cambria Company bought 41,000 tons of Bessemer pig, of which 18,000 tons was for delivery during this year. This has pretty well cleaned up the available supply of this grade in the Central West. Since then another large steel company has bought 20,000 tons of basic pig in the Buffalo market, and there has been another buying movement in eastern Pennsylvania which involved a large tonnage for delivery during the fourth and first quarters. Steel founders are in the St. Louis and Chicago markets for large blocks of basic pig for next year, while one steel mill is out with an inquiry for 12,000 to 18,000 tons of low phosphorus iron.

The cast iron pipe makers continue to be persistent buyers, but find the market bare of low grades. A leading interest is seeking relief abroad, and has bought one cargo, from 4000 to 5000 tons of Middlesbrough No. 4, for delivery on the Delaware River, at private terms. A large Chicago founder is in the market for 16,000 to 20,000 tons, and there are intimations that agricultural implement makers would take from 30,000 to 40,000 tons of foundry iron for the balance of this year and for the first half of 1910 at a satisfactory price. A new England malleable foundry has bought a large lot of malleable Bessemer pig, and a group of New England and New York malleable works are negotiating. The Pennsylvania Railroad is asking for bids for 6000 tons of foundry iron, chiefly for delivery at Altoona, and a railroad equipment shop is out with requirements for 10,000 tons.

There are many small buyers of foundry iron in the market, many of whom had evidently underrated their requirements for early delivery, and there is every evidence that buying on the part of consumers for delivery during the next year is confident and liberal.

A good share of the business put through during the week has been taken by furnacemen who have been satisfied to put back log orders on their books, for delivery during the first and second quarters, at the present level of prices.

Steel billets are scarce. One large steel plant in eastern Pennsylvania has bought a round lot of steel, and is negotiating for additional tonnage, the shortage being approximately 20,000 tons.

The first signs are appearing of a renewal of buying of rolling stock by the railroads. Some moderate sales have been made and some further negotiations are pending.

Figuring is going on for 9 or 10 additional boats for the lake ore trade. A moderate amount of work is coming to the structural shops, among the contracts awarded being 7800 tons for terminal work at Detroit for the Michigan Central, 3000 tons of bridge work for the Norfolk & Western, and 2500 tons for a Government building at New Orleans. Bids go in on November 1 for the free bridge at St. Louis, which will require 16,300 tons of material.

Rail sales during the week figure up about 100,000 tons.

The copper market is weaker. Announcements are expected in the trade to-day or to-morrow of a lowering in the price by at least one leading producer.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

Oct. 13, Oct. 6, Sept. 15, Oct. 14,
1909. 1909. 1909. 1908.

PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	\$18.50	\$18.50	\$18.00	\$16.75
Foundry No. 2, Southern, Cincinnati	17.75	17.75	17.25	15.75
Foundry No. 2, local, Chicago ..	19.00	19.00	18.50	16.85
Basic, delivered, eastern Pa.	18.00	18.00	18.00	15.50
Basic, Valley furnace	17.00	16.75	15.75	14.00
Bessemer, Pittsburgh	19.40	18.90	17.90	15.90
Gray forge, Pittsburgh	16.00	16.00	15.90	14.40
Lake Superior charcoal, Chicago	19.50	19.50	19.50	19.50

BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh ..	26.00	25.00	25.00	25.00
Forging billets, Pittsburgh	29.00	29.00	29.00	27.00
Open hearth billets, Philadelphia	28.60	27.60	27.50	26.20
Wire rods, Pittsburgh	32.00	31.50	31.50	33.00
Steel rails, heavy, at mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:				
Steel rails, melting, Chicago ..	17.75	17.75	16.50	14.75
Steel rails, melting, Philadelphia	18.00	18.00	17.25	15.00
Iron rails, Chicago	20.50	20.50	19.00	18.00
Iron rails, Philadelphia	21.00	21.00	20.00	19.50
Car wheels, Chicago	<i>18.25</i>	18.50	18.50	15.25
Car wheels, Philadelphia	17.50	17.50	17.00	15.00
Heavy steel scrap, Pittsburgh ..	18.00	17.75	17.50	15.25
Heavy steel scrap, Chicago	16.50	16.75	16.00	13.50
Heavy steel scrap, Philadelphia	18.00	18.00	17.25	15.00

FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia ..	1.57	1.57	1.52	1.45
Common iron bars, Chicago	1.50	1.50	1.45	1.50
Common iron bars, Pittsburgh ..	1.65	1.55	1.50	1.40
Steel bars, tidewater, New York ..	1.66	1.66	1.56	1.56
Steel bars, Pittsburgh	1.50	1.50	1.40	1.40
Tank plates, tidewater, New York	1.66	1.66	1.66	1.76
Tank plates, Pittsburgh	1.50	1.50	1.50	1.60
Beams, tidewater, New York	1.66	1.66	1.66	1.76
Beams, Pittsburgh	1.50	1.50	1.50	1.60
Angles, tidewater, New York	1.66	1.66	1.66	1.76
Angles, Pittsburgh	1.50	1.50	1.50	1.60
Skelp, grooved steel, Pittsburgh ..	1.45	1.45	1.40	1.45
Skelp, sheared steel, Pittsburgh ..	1.55	1.55	1.50	1.50

SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.30	2.30	2.20	2.90
Wire nails, Pittsburgh	1.80	1.80	1.80	1.95
Cut nails, Pittsburgh	1.80	1.80	1.75	1.80
Barb wire, galv., Pittsburgh	2.10	2.10	2.10	2.40
METALS, Per Pound:				
Lake copper, New York	13.00	13.50	13.50	13.75
Electrolytic copper, New York ..	<i>12.99</i>	13.00	13.00	13.37½
Spelter, New York	5.90	5.90	5.85	4.77½
Spelter, St. Louis	5.75	5.75	5.70	4.62½
Lead, New York	<i>4.37½</i>	4.38	4.40	4.35
Lead, St. Louis	<i>4.25</i>	4.25	4.30	4.20
Tin, New York	30.25	30.50	29.90	29.25
Antimony, Hallett, New York ..	<i>8.30</i>	8.30	8.37½	7.75
Nickel, New York	45.00	45.00	45.00	45.00
Tin plate, 100 lb., New York	\$3.74	\$3.74	\$3.64	\$3.89

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel F.O.B. Pittsburgh.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Shapes.—I-beams and channels, 3 to 15 in., inclusive, 1.50c., net; I-beams over 15 in., 1.60c., net; H-beams over 8 in., 1.70c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.55c., net; angles, over 6 in., 1.60c., net; angles, 3 x 3 in. and up, less than ¼ in., 1.70c., base, half extras, steel bar card; tees, 3 in. and up, 1.60c., net; tees, 3 in. and up, 1.55c., net; angles, channels and tees, under 3 in., 1.45c., base, plus 10c., half extras, steel bar card; deck beams and bulb angles, 1.75c., net; hand rail tees, 2.75c., net; checkered and corrugated plates, 2.75c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.50c. to 1.60c., base. Extras over this price are as follows:

Tank, ship and bridge quality, ¼-in. thick on edges, 100 in. wide, down to but not including 6 in. wide, is taken as base.

Steel plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, shall be considered $\frac{1}{4}$ -in. plate. Steel plates over 72 in. wide must be ordered $\frac{1}{4}$ -in. thick on edge, or not less than 11 lb. per square foot, to take base price. Steel plates over 72 in. wide, ordered less than 11 lb. per square foot down to the weight of 3-16-in. shall take the place of 3-16-in.

Percentages as to overweight on plates, whether ordered to gauge or weight, to be governed by the Association of American Steel Manufacturers' Standard Specifications.

Gauges under $\frac{1}{4}$ -in. to and including 3-16-in. plates on thin edges.....	\$0.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
All sketches (excepting straight taper plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.).....	.10
Complete circles.....	.20
Boller and flange steel plates.....	.10
"A. B. M. A." and ordinary firebox steel plates.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Shell grade of steel is abandoned.	
For widths over 100 in. up to 110 in.....	.05
For widths over 110 in. up to 115 in.....	.10
For widths over 115 in. up to 120 in.....	.15
For widths over 120 in. up to 125 in.....	.25
For widths over 125 in. up to 130 in.....	.50
For widths over 130 in.....	1.00

TERMS.—Net cash 30 days. Pacific Coast base, 1.30c. f.o.b. Pittsburgh.

Sheets.—Minimum prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, 1.65c.; Nos. 9 and 10, 1.70c.; Nos. 11 and 12, 1.75c.; Nos. 13 and 14, 1.80c.; Nos. 15 and 16, 1.90c.; box annealed sheets, Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c.; galvanized sheets, Nos. 13 and 14, 2.35c.; Nos. 15 and 16, 2.45c.; Nos. 17 to 21, 2.60c.; Nos. 22 to 24, 2.75c.; Nos. 25 and 26, 2.95c.; No. 27, 3.15c.; No. 28, 3.35c.; No. 29, 3.45c.; No. 30, 3.70c. Painted roofing sheets, No. 28, \$1.60 per square. Galvanized roofing sheets, No. 28, \$2.85 per square for $\frac{2}{2}$ in. corrugations.

Wrought Pipe.—Discounts on steel pipe, $\frac{3}{4}$ to 6 in., in carloads to the largest trade, are 80 and 5 per cent. off list, and on iron pipe, $\frac{3}{4}$ to 6 in., are 75 and 5 per cent. off list.

Boiler Tubes.—Regular discounts, effective from October 1, 1909, on steel and charcoal iron boiler tubes are as follows:

	Steel.	Iron.
1 to $1\frac{1}{4}$ in.....	.49	.43
$1\frac{1}{4}$ to $2\frac{1}{4}$ in.....	.61	.43
$2\frac{1}{4}$ in.....	.63	.48
$2\frac{1}{2}$ to 5 in.....	.69	.55
6 to 13 in.....	.61	.43
$2\frac{1}{2}$ in. and smaller, over 18 ft. long, 10 per cent. net extra.		
$2\frac{1}{2}$ in. and larger, over 22 ft. long, 10 per cent. net extra.		

Wire Rods.—Bessemer, open hearth and chain rods, \$32.

Steel Rivets.—Structural rivets, 1.90c., base; boiler rivets, 2c., base, subject to usual extras.

Chicago.

FISHER BUILDING, October 13, 1909.—(By Telegraph.)

In the heavy lines of finished steel the problem of paramount interest among local producers is that of reducing the congested condition of order books which are overflowing with specifications. Thus far tonnage of this character has been coming in as fast or faster than it is going out, and deliveries of bars, shapes and universal plates are running weeks behind the usual normal movement. Pending the disposal of deferred business, to the extent at least of making headway against accumulating orders, the mills are reluctant to open a campaign for new business involving contracts through the first half of next year. Since none of the prominent steelmakers in this district is able to take any additional tonnage of consequence for shipment the rest of this year, new buying is limited to a comparatively few forward contracts in which the leading interest is not participating except on specific transactions covering definite amounts with specifications. From a few Eastern mills reasonably prompt shipment of plates may be had at prices ranging from 1.73c. to 1.78c., base, Chicago. New standard rail orders, amounting in all to 30,000 tons, were taken last week by the leading interest, which now has close to 500,000 tons entered for next year's rolling on the Gary and South Works mills. At the former plant 18 open hearth furnaces are in operation this week, and this capacity is not likely to be materially increased until more pig iron is provided by the blowing in of the fifth blast furnace, which is scheduled for starting some time this month.

Pig Iron.—The pig iron market has drifted into a state of comparative inactivity, which contrasts sharply with the heavy buying of recent weeks. There is little demand for prompt iron, and the general opinion seems to be that the requirements of consumers are pretty well covered for the rest of the year. Being thus fairly well provided for the immediate future, buyers seem disposed to wait for a while before making further commitments at the present price level. Two of the leading Southern furnace interests have

temporarily withdrawn from the market, and, as far as can be learned, none of those still selling are booking any tonnage for deliveries beyond first quarter. Except for occasional car lots on track or in transit, that may possibly be had at \$14.50, Southern iron is being firmly held at \$15, Birmingham, for all deliveries, including first quarter. No change has been made by the local Northern furnaces in the schedule last reported—namely, \$18.50 for last quarter, \$19 first quarter and \$19.5 second quarter, at furnace. Several inquiries have been put out by some of the larger consumers with the idea apparently of feeling the market as to prices on extended deliveries. Prices were asked last week by a local manufacturer on about 16,000 tons for deliveries running a year ahead. The specifications included about 6000 tons of No. 2 Southern iron and 4000 tons of high silicon, the remainder being off grades suitable for brake shoes. It is understood that no satisfactory offers were received and the inquiry has been withdrawn. A similar inquiry has been put out by a Milwaukee machinery concern for about 4000 tons, including 2000 tons of Northern foundry and 1000 tons each of high silicon and charcoal, for last half delivery, or, if more advantageous offers can be secured for earlier shipment, second quarter delivery will be considered. Figures are being asked on 5000 to 6000 tons of basic by a prominent steel foundry for delivery at St. Louis, and another melter in that market is inquiring for a fair amount of basic. Evidence of an approaching car shortage is seen in an order issued by a leading Southern road requesting that none of its cars be permitted to pass beyond its northern terminus at the Ohio River. This is recognized as indicating an existing scarcity of cars and will result in the re-loading of consignments destined for points north of the Ohio River. Such rehandling is certain to occasion much inconvenience to shippers and will likewise be productive of more or less delay. The following quotations are for October, November and December delivery, f.o.b. Chicago:

Lake Superior charcoal.....	\$19.50 to \$20.00
Northern coke foundry, No. 1.....	19.50 to 20.00
Northern coke foundry, No. 2.....	19.00 to 19.50
Northern coke foundry, No. 3.....	18.50 to 19.00
Northern Scotch, No. 1.....	19.00 to 19.50
Southern coke, No. 1.....	19.85 to 20.35
Southern coke, No. 2.....	19.35 to 19.85
Southern coke, No. 3.....	18.85 to 19.35
Southern coke, No. 4.....	18.35 to 18.85
Southern coke, No. 1 soft.....	19.85 to 20.35
Southern coke, No. 2 soft.....	19.35 to 19.85
Southern gray forge.....	17.85 to 18.35
Southern mottled.....	17.60 to 18.10
Mal'enable Bessemer.....	18.50 to 19.00
Standard Bessemer.....	19.90 to 20.40
Jackson Co. and Kentucky silvery, 6%.....	20.40 to 20.90
Jackson Co. and Kentucky silvery, 8%.....	21.40 to 21.90
Jackson Co. and Kentucky silvery, 10%.....	22.40 to 22.90

(By Mail.)

Billets.—Consumers of forging billets continue to look to Eastern mills for their requirements, as local producers are unable to take any further orders. It is expected that the 18-in. stands of the new Gary billet mill will be in shape to commence rolling some time this week.

Rails and Track Supplies.—A majority of the leading Western railroad systems have already placed orders for a large portion of their 1910 requirements, and the heavy buying movement which has kept the market active for a few weeks has subsided. The only new business reported is 30,000 tons taken by the leading interest, being distributed, 20,000 tons of open hearth in one lot, 5000 tons of Bessemer in another and 5000 tons made up of miscellaneous orders. There are, however, two or three Western roads which have not yet come into the market, but are expected to open negotiations soon. The demand for track fastenings continues very heavy, and on bolts, especially the local mills, are sold up far in advance, and are unable to execute orders without considerable delay. While the minimum prices quoted are applicable to orders taken subject to the mill's convenience as to delivery, higher prices are secured by makers able to promise prompt shipment. We quote standard railroad spikes at 1.80c., base; track bolts and square nuts, 2.25c. to 2.50c., base, all in car lots, Chicago. Light rails, 40 to 45 lb., \$26; 30 to 35 lb., \$26.75; 16, 20 and 25 lb., \$27; 12-lb., \$28, Chicago, less 50c. a ton on lots of 500 tons and \$1 a ton on lots over 500 tons.

Structural Material.—No lots of important size were included in fabricating contracts let last week, and business in this line shows a considerable falling off. Prices obtained for fabricated work, while several notches above the low point reached some months ago, have not attained a satisfactory degree of uniformity. A contract of 380 tons for the Sanders Building was awarded to the Schrader Iron Works, San Francisco, and a mercantile building at Flint, Mich., 449 tons, went to Bolter & Sons, Chicago. Plans have been completed for the St. Louis free bridge, and bids will be taken about November 1. According to the estimates made, 16,300 tons of structural material will be required, the specifications calling for nickel steel. Preparations are being made for the construction of the Mohawk Office Building on the southeast corner of Monroe and Dearborn streets, Chicago, plans for which will be ready in about 10 days. It has not yet been determined whether the building will be

10 or 20 stories in height; if the former, about 2000 tons will be required, and if the latter double this amount. Mill deliveries are still running far behind, and not much progress is being made in catching up on rolling schedules. A good deal of reluctance is being manifested by the mills in booking for deliveries next year. Some business for the first quarter, and possibly beyond, has been entered, but such transactions are generally confined to specified amounts. No open contracts are being solicited, and mills able to furnish material with reasonable promptness can command a premium over the minimum price. We quote plain material from mill at 1.68c. to 1.78c., Chicago; from store, 1.90c., Chicago.

Plates.—An order for 1000 steel ore cars has been placed by a Western railroad with the Pressed Steel Car Company; these cars will be built in the Hegewisch shops of this concern, but orders for the material have not yet been placed. Specifications for both sheared and universal plates continue very heavy, and satisfactory deliveries on new orders are difficult to obtain from any source outside of jobbers' stocks. Store shipments are in consequence unusually heavy. None of the leading mills has opened a campaign for business involving deliveries extending through the first quarter and half of next year, though in some instances contracts of this kind have been taken. Prices above minimum are secured by makers who are able to promise early shipment. We quote mill prices at 1.68c. to 1.78c., Chicago; store prices, 1.90c., Chicago.

Sheets.—The demand for sheets continues to grow in face of the advance announced last week by the leading interest, which has been closely followed by practically all of the independent mills. In fact, a few, and among them the local mills, are asking still higher prices for shipments beyond January 1. By that time the latter interest will have additional sheet mill capacity in operation, and will also have more than doubled its galvanizing department. Prices are firm on the basis of 2.30c. for No. 28 black and 3.35c. for No. 28 galvanized, Pittsburgh. Owing to the increasing delay in shipments of specifications from mill, jobbers' stocks are more or less broken. The market from store is firm at 2.85c. to 2.95c. for No. 28 black, and 3.90 to 4c. for No. 28 galvanized.

Bars.—Consumers are pressing for shipments of steel bars, the demand for which has grown extremely urgent. Deliveries are already so far behind that it is next to impossible for the mills to name dates of shipment on new business. Specifications are being supplied faster than they can be taken care of, a situation for which no immediate relief is in sight. While a good many inquiries are coming out respecting requirements for the first half of next year, bookings for this period are comparatively light, owing to the disposition of the mills to hold back on forward commitments. It may be said that 1.50c., Pittsburgh, has been tentatively established as the basis upon which contracts for first quarter and, perhaps, the entire first half, of 1910 will be accepted. At any rate some forward business has been entered at this figure. It is only on the most desirable specifications and quantities of iron bars that the minimum price of 1.50c. applies, the leading mills having all lined up pretty firmly at 1.55c. We quote steel bars at 1.58c. to 1.68c., according to the character of specifications offered and deliveries desired; bar iron and hard steel bars, 1.50c. to 1.55c., all Chicago.

Merchant Pipe.—The late advance of \$2 a ton in merchant pipe has caused no diminution in the general volume of business. Jobbers continue to anticipate their requirements for 30 to 60 days, and the demand is quite satisfactory. In view of the extraordinary development in building construction, uninterrupted, as it is, by weather and labor complications, the outlook for a well sustained demand is most encouraging.

Boiler Tubes.—Railroads are specifying quite freely for locomotive tubes, and a fair amount of new business is being placed. Some picking up in the demand for merchant tubes is also noted, and, although this division of the market has been one of the slowest to respond to improved conditions, it is gradually becoming more active.

Cast Iron Pipe.—A letting of 500 tons by the village of Terrace Park, Ohio, was awarded to the United States Cast Iron Pipe & Foundry Company. Among the municipal contracts up for consideration are Newark, Ohio, 750 tons, and Bradford, Ohio, 250 tons. No inquiries of important size are reported, but it is understood that a number of gas companies and municipal water plants are making up specifications on their needs for the coming year, with a view to coming into the market at an early date.

Metals.—Under the incubus of an oversupply of metal, the copper market has developed further weakness. There is a fairly active demand for small lots, but under the circumstances consumers seem to be in no hurry about providing for future wants. Several inquiries of considerable size have been received, some of them calling for shipments as far ahead as March of next year, but no closures have been reported. Spelter is firmer and a fraction higher, and an advance of $\frac{1}{4}$ c. on sheet zinc is announced. Old metals, although moving better than for some time, have developed

no quotable change in values. We quote as follows: Casting copper, 13c.; lake, $13\frac{1}{2}$ c., in carloads, for prompt shipment; small lots, $\frac{1}{4}$ c. to $\frac{3}{8}$ c. higher; pig tin, car lots, $31\frac{1}{2}$ c.; small lots, 33c.; lead, desilverized, 4.45c. to 4.55c., for 50-ton lots; corroding, 4.70c. to 4.80c., for 50-ton lots; in carloads, $2\frac{1}{2}$ c. per 100 lb. higher; spelter, 5.90c. to 5.95c.; Cookson's antimony, $10\frac{3}{4}$ c., and other grades, $9\frac{3}{4}$ c. to $10\frac{1}{4}$ c.; sheet zinc is \$7.75, f.o.b. La Salle, in car lots of 600-lb. casks. On old metals we quote: Copper wire, crucible shapes, $13\frac{1}{4}$ c.; copper bottoms, $11\frac{1}{2}$ c.; copper clips, $12\frac{1}{4}$ c.; red brass, $11\frac{1}{2}$ c.; yellow brass, $9\frac{1}{4}$ c.; light brass, $6\frac{3}{4}$ c.; lead pipe, $4\frac{1}{2}$ c.; zinc, 4.50c.; pewter, No. 1, 23c.; tin foil, 25c.; block tin pipe, 27c.

Old Material.—The market shows no signs of weakness. The flurry occasioned by the reported buying of melting steel by the leading interest for the Gary mills has subsided, but the general demand is broad enough to sustain prices at their present level. The demand is well distributed, but no individual transactions involving heavy quantities have come to light. All of the rolling mills in this district have accumulated large stock piles, but most of them are buying more or less all the time. Machine shop turnings are in good demand, and foundry melting grades, such as No. 1 cast, stove plate and malleable, find a ready market at firm prices. A list of about 7200 tons, of which 3200 tons is old steel rails, is being offered this week by the Northern Pacific. The following prices are per gross ton, f.o.b. Chicago:

Old iron rails.....	\$20.50 to \$21.50
Old steel rails, rerolling.....	18.00 to 18.50
Old steel rails, less than 3 ft.....	17.75 to 18.25
Relaying rails, standard sections, subject to inspection.....	23.50 to 24.50
Old car wheels.....	18.25 to 18.75
Heavy melting steel scrap.....	16.50 to 17.00
Frogs, switches and guards, cut apart.....	16.75 to 17.25
Shoveling steel.....	16.00 to 16.50

The following quotations are per net ton:

Iron angles and splice bars.....	\$18.00 to \$18.50
Iron car axles.....	21.00 to 21.50
Steel car axles.....	20.00 to 20.50
No. 1 railroad wrought.....	16.00 to 16.50
No. 2 railroad wrought.....	15.00 to 15.50
Springs, knuckles and couplers.....	15.75 to 16.25
Locomotive tires, smooth.....	17.00 to 17.50
No. 1 dealers' forge.....	13.50 to 14.00
Steel axle turnings.....	11.75 to 12.25
Machine shop turnings.....	11.00 to 11.50
Cast and mixed borings.....	7.50 to 8.00
No. 1 bushelling.....	13.50 to 14.00
No. 2 bushelling.....	10.25 to 10.75
No. 1 boilers, cut to sheets and rings.....	11.50 to 12.00
No. 1 cast scrap.....	15.75 to 16.25
Stove plate and light cast scrap.....	13.50 to 14.00
Railroad malleable.....	15.25 to 15.75
Agricultural malleable.....	13.75 to 14.25
Pipes and flues.....	12.00 to 12.50

Birmingham.

BIRMINGHAM, ALA., October 11, 1909.

Pig Iron.—Recent developments are not indicative of a change in the views of any parties concerned in this market. Producers without exception adhere to the \$15, Birmingham, schedule for shipments over the remainder of this year or through the first quarter of next year. The quantity available for early delivery is limited and a conservative course is generally pursued as to commitments for the first quarter. The trade appears to be principally interested in bargain lots, and the demand is being met largely by merchant and resale iron for immediate shipment. The sales reported by the furnace companies conform to the terms of the established quotation and aggregate a more satisfactory tonnage than was sold the week previous. A leading interest reports the sale of some 2000 tons for the first quarter at \$15, Birmingham, for No. 2 foundry; another reports 1000 tons sold for the first quarter at that price, and still another 750 tons. A comparatively small lot of No. 1 foundry for early shipment is reported sold at \$15.25, Birmingham, and Clifton high manganese in small lots for the first quarter recently brought \$16. On the resale iron offered, a basis of \$14.50, Birmingham, is the lowest price known to have been considered. As to the amount available at such figures a definite statement is not warranted. So far as can be ascertained, no advanced deliveries have been offered by the merchant interests at lower figures than those quoted by the furnace companies, and the resale iron for prompt shipment has been increased by the congested condition of foundry yards, and the disposition of producers as to delivery on engagements at figures considerably lower than are now being asked. Within the past week two of the smaller producing interests have opened their books for first-quarter commitments, but deliveries to cover the entire first half are not yet considered.

Cast Iron Pipe.—The details of recent transactions involving round tonnages are not made public, and in the absence of evidence to the contrary the market value of water pipe is believed to be correctly represented by the quotations last published. Of the past week's business, the most significant transactions involved small lots for prompt

shipment. As has been the case for some weeks, the prices received for such small lots as are in demand represent a higher average than is indicated by the authorized quotations, and in view of the condition of the pig iron market it is quite likely that only a limited amount is available on municipal contracts at the prices now being asked. Local interests are generally satisfied with the situation as it now appears, and will no doubt be in position to maintain higher quotations when the market is again active by reason of the close adjustment of the present rate of production to order book requirements. We quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., \$26; 8 to 12 in., \$25; over 12 in., average \$24, with \$1 per ton extra for gas pipe.

Old Material.—Notwithstanding the inactivity of the pig iron market, the demand for old material is quite in excess of the available supply. This is especially true of the wrought and steel grades, and for old car wheels. The aggregate sold in the past week was quite satisfactory to dealers, and in view of recent unsuccessful efforts to replenish stocks, orders for additional lots are not being solicited. We quote dealers' asking prices, which are firm, f.o.b. cars here, as follows:

Old iron rails.....	\$17.50 to \$18.00
Old iron axles.....	18.50 to 19.00
Old steel axles.....	16.50 to 17.00
No. 1 railroad wrought.....	13.50 to 14.00
No. 2 railroad wrought.....	11.50 to 12.00
No. 1 country.....	11.00 to 11.50
No. 2 country.....	10.50 to 11.00
No. 1 machinery.....	12.50 to 13.00
No. 1 steel.....	12.50 to 13.00
Tram car wheels.....	11.50 to 12.00
Standard car wheels.....	13.00 to 13.50
Light cast and stove plate.....	11.50 to 12.00
Cast borings.....	6.00 to 6.50

The furnace of the Southern Iron & Steel Company, at Trussville, Ala., has been put in operation. The Chattanooga furnace of this company is expected to follow within a short time.

The coke ovens of the Tennessee Coal, Iron & Railroad Company at Blocton, Ala., have been lighted up, after having been out of commission for many years. Coal production in Alabama shows a steady increase, and the car shortage in that direction is becoming acute.

Philadelphia.

PHILADELPHIA, PA., October 12, 1909.

There has been a fair volume of business both in the pig iron and finished material markets. The general situation continues strong, although in some instances buyers, having pretty well covered for their near future needs, are a little inclined to hold off before making further purchases, but they keep in close touch with the market. Prices remain firm, and in some few instances further advances are noted, but it is usually the smaller buyer that has to pay the higher range. Individual conditions play an important part in many transactions, both as regards tonnage and price. No large supplies of pig iron are available in this district for prompt shipment, and makers are not anxious to take orders for extended delivery at the present level of prices. A further advance in the price of steel billets is noted. Sheets also show an upward movement, but in other finished materials prices are firm and unchanged. Most makers still refuse to open order books for strictly 1910 delivery.

Pig Iron.—A larger volume of business has been transacted in some grades. Some buyers are inclined to hold off and, as sellers make no effort to force business, the market at times takes on an appearance of a waiting character. A number of transactions have been reported in the foundry grades, and a wider range of prices prevails than is usually the case. Sales range from carload lots, for prompt shipment, up to 1000 ton lots for delivery over the next six months, with prices at times showing a variation of a full dollar a ton for No. 2 X foundry, dependent upon individual conditions. For standard eastern Pennsylvania No. 2 X foundry \$18.50, delivered, is the minimum, and no appreciable tonnage is available at that price. Some sellers, however, readily obtain \$19 for that grade for this year's delivery, and as high as \$19.50 has been done in several instances, while some few sellers are naming the latter price as their minimum figure. Producers are, no doubt, in a very strong position, and quotations, when made, are usually subject to early acceptance. Foundry iron stocks are small, and, while there is still a fair amount of iron for this year's delivery available, sellers are not inclined to dispose of it in large lots. A movement in foreign iron is noted, a cargo of about 5000 tons of No. 3 Middlesbrough being taken by one of the Delaware River cast iron pipe foundries at a price which is believed to have been between \$17.50 and \$17.75, delivered. Some little business in domestic foundry iron for next year's delivery has been done; one lot of 1000 tons of No. 2 X for shipment during the next six months is reported at \$19, de-

livered, while some smaller lots for the first quarter shipment have been sold at \$19.50. The Pennsylvania Railroad, which has been inquiring for some 6000 tons of mixed foundry grades for delivery during the first quarter of next year has decided on a portion of its requirements, and the full allotment, it is believed, will be placed in the next few days. Virginia foundry irons have been rather quiet; outside of the leading Virginia producer furnaces have but little iron to offer. Prices are firmly held at \$16 to \$16.50, furnace, for No. 2 X, equal to \$19 and \$19.50, delivered here, which is above the market for Northern irons delivered in this vicinity. Southern iron continues strong, but at the present range of prices is not a factor in this district. Forge iron is in good demand, and a number of inquiries for moderate tonnages are reported, but few sellers have any iron of this grade to offer for early delivery, and will not sell for extended shipment. Several moderate lots have been sold at close to \$17.50, delivered, while one lot of 3000 tons of off basic was taken at \$17.75, delivered. A further moderate movement in basic iron is noted; some 8000 to 10,000 tons have been sold to Eastern mills, for shipment over the balance of the year, at \$18, delivered, while one lot of 4000, for early 1910 shipment, has been taken at \$18.50. There still seem to be negotiations under way for foreign basic, and it is not unlikely that a small tonnage might be imported, largely as an experiment. There has been a better demand for low phosphorus iron; a number of inquiries for tonnages of moderate size are before the trade, while one steel mill is out with an inquiry for 12,000 to 18,000, delivery on which would begin next April. Sales for delivery in this territory have not been large; one maker, however, sold a block, running close to 1000 tons, for delivery early next year, to a buyer outside the district at a price equal to \$22.50, delivered in this district. The general tone of the iron market is quite strong, and prices appear to be very firmly maintained at the present level for practically all grades. For delivery in buyers' yards, eastern Pennsylvania and nearby points, the following range of prices is quoted, shipment, for the most part, during the fourth and first quarters:

Eastern Pennsylvania, No. 2 X foundry.....	\$18.50 to \$19.50
Eastern Pennsylvania, No. 2 plain.....	18.00 to 19.00
Virginia, No. 2 X foundry.....	18.75 to 19.50
Virginia, No. 2 plain.....	18.50 to 19.00
Gray forge.....	17.50 to 17.75
Basic.....	18.00 to 18.50
Low phosphorus.....	22.00 to 22.50

Ferromanganese.—The demand in this vicinity has been rather quiet. There has been some inquiry for moderate lots for extended 1910 delivery, but the business closed has been mostly for either prompt or early next year shipment, prices for which show some variation, ranging from \$43 to \$45, Baltimore. Sales of 600 to 800 tons, for shipment outside the district, for fourth and first quarter delivery, are reported at \$43 to \$44, seaboard.

Billets.—Prices again show an upward movement, makers in this territory now naming \$28, at mill, for ordinary rolling billets for early delivery. This price is equivalent to \$28.60, delivered here. Sales have been made at the new basis, in some instances good size tonnages, for delivery over the balance of the year, having been taken. Forging billets appear to be even in better demand than the ordinary billets, and prices now range from \$31 to \$33. Eastern mill, dependent upon individual conditions, the usual extras applying for special sizes and high carbons. Mills in this vicinity are pretty well filled up, and are not seeking business, nor will they accept orders on which deliveries extend beyond the year end.

Plates.—There does not seem to be the same rush on the part of buyers to get in orders. It is pretty well established now that sellers will not accept business for next year, and the bulk of the orders taken are for early delivery, or on which shipments against specifications begin in the near future. Mills are fully engaged, and the output is, in instances, again increasing. No particularly heavy orders have been reported, the bulk of the tonnage being of a miscellaneous character. Prices are unchanged, and while some mills state that their minimum price for ordinary plates, delivered in this territory, is 1.75c. for prompt business of a desirable character, 1.65c., delivered, can still be done.

Structural Material.—The most important contract in this vicinity, covering some 3000 tons, for a building in Baltimore, has not yet been let, although bids were opened several days ago. New propositions of any size are rather scarce, although there has been a very good tonnage of small and moderate size orders for fairly prompt shipment. Mills are fully employed and deliveries are not improving. Prices are firm, plain material commanding from 1.65c. to 1.75c., dependent on specifications as well as how anxious mills are to take on additional tonnage.

Sheets.—A greater volume of business is being offered, and while orders for reasonably early delivery are taken at recent quotations, prompt deliveries, or those 60 to 90 days distant, command a premium of \$1 to \$2 a ton, dependent upon individual conditions. Makers are well booked ahead and still refuse to consider orders on which delivery beyond

the year end is named. Quotations, while to a considerable extent nominal, range about as follows for deliveries during the next 30 days: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

Bars.—The scarcity of steel bars, for early delivery, has resulted in an increased volume of business coming to the refined iron bar makers who have taken on somewhat more tonnage, and the tendency of prices is upward. Steel bars are quoted firmly at 1.65c., delivered here, and some mills will not accept orders for bars under 1½ in., and cannot make good deliveries on the larger sizes. Refined iron bars, for delivery in this territory, are quoted at 1.57c. to 1.62c., shipment during the balance of the year, orders for extended delivery being refused in the majority of cases.

Coke.—The demand for coke continues heavy, and sellers report a large volume of inquiries both for prompt and forward deliveries. Sales have not been large, as producers have very little prompt coke to offer and refuse in many cases to quote for next year's deliveries. Prices for moderate lots for this year's delivery are unchanged; for next year's shipment, however, an advance of about 10c. a ton is asked for some brands. For delivery in buyers' yards in this territory the following range of prices per net ton about represents the market for shipments during the next three months:

Connellsville furnace coke.....	\$4.95 to \$5.15
Foundry coke.....	5.10 to 5.25
Mountain furnace coke.....	4.55 to 4.75
Foundry coke.....	4.70 to 4.85

Old Material.—The market has been somewhat more active. The associated steel mills are obtaining a good supply of heavy melting steel, and while still paying \$18, delivered, are scrutinizing shipments more closely. A cargo of 4000 tons of foreign crops has arrived at this port, and foreign steel scrap is expected to come in quite freely during the next 30 days. This material practically all goes to the associated mills. One outside interest purchased about 15,000 tons of domestic steel scrap at \$18.50, delivered, and sales between brokers have been reported at the same price. Machinery cast scrap has been more active; fair tonnages have been sold at \$17, while as much as \$18 has been paid for carload lots. Railroad wrought is firm on moderate sales. One lot of 600 tons of this grade arrived at this port, by boat, from Galveston during the week. The tone of the market is strong, and prices, while nominally quoted, as far as some special grades are concerned, range about as follows for prompt delivery in buyers' yards in this vicinity:

No. 1 steel scrap and crops.....	\$18.00 to \$18.50
Low phosphorus.....	22.00 to 22.50
Old steel axles.....	23.50 to 24.50
Old iron axles.....	29.00 to 30.00
Old iron rails.....	21.00 to 22.00
Old car wheels.....	17.50 to 18.00
Choice No. 1 R. R. wrought.....	20.50 to 21.00
Machinery cast.....	17.00 to 18.00
Railroad malleable.....	17.00 to 17.50
Wrought iron pipe.....	17.50 to 18.00
No. 1 forge fire scrap.....	16.50 to 17.00
No. 2 light iron.....	10.00 to 10.50
Wrought turnings.....	15.50 to 16.00
Stove plate.....	14.00 to 15.00
Cast borings.....	13.50 to 14.00
Grate bars.....	14.50 to 15.00

St. Louis.

ST. LOUIS, Mo., October 11, 1909.

The past week, being devoted to the local centennial celebration, has partaken of the usual holiday character and the attention of manufacturers and wholesale merchants has been largely diverted from routine business, while retailers, on the other hand, have reaped a rich harvest, since it is estimated that over 200,000 visitors spent most of the week in viewing the parades and other features of entertainment. The feeling prevailing among all classes of business men is decidedly optimistic, and the increasing delay in the shipment of coke, iron and other commodities indicates both a shortage in supplies and in transportation facilities.

Coke.—The leading sales agencies report a steady demand for coke in moderate lots. The larger buyers are more concerned to secure prompt shipment of contract coke than, at present, to enter the market with new business. One house states that it is behind to the extent of over 50 cars which were ordered shipped from two to three weeks ago. New business is checked to some extent by the belief of buyers that there is no warrant in anticipating wants on the ground of a further advance, since they regard the price of coke fully in line with pig iron, and without a further advance on the part of producers the coke interests will not be likely to demand higher prices in the near future. We quote the market firm, with an upward tendency, at \$2.90 to \$3 for standard 72-hour foundry for shipment over the balance of the year; \$3 to \$3.15 for shipment over the first half of 1910, per net ton, f.o.b. oven, Connellsville.

Pig Iron.—While in some instances brokers report a good demand for pig iron, others state that business for the past week has ruled quiet. We learn of an inquiry for 10,000 tons of basic for shipment over the first quarter or first half of 1910, and of a sale of 4000 tons of basic; also

sales of 500 tons of Northern charcoal and 500 tons of foundry iron for shipment over the first half of 1910, with numerous sales of small lots of Southern foundry. A premium is occasionally offered to secure spot iron by parties experiencing delay in the shipment of contract iron. Notwithstanding it is claimed that the rapid and sharp advance in the price of pig iron is warranted by nearly two years of underconsumption, yet as many of the larger buyers are filled up the demand is less urgent in St. Louis territory, and it is also believed that more merchant producers will resume operations and thus increase the output of pig iron. A leading Southern producer, however, has refused to confirm a conditional sale of 2500 tons on the basis of \$15, Birmingham, for shipment over the first quarter of 1910. We quote Southern No. 2 foundry at \$15, Birmingham, for shipment over the balance of this year and the first quarter of 1910, with one leading house offering to book orders at this figure for shipment over the first half.

Lead, Spelter, Etc.—The market for lead is firmer, with sales at 4.27½. Spelter is strong at 5.87½, East St. Louis; the demand is better. Tin is up ¼c.; antimony is unchanged; copper is easier. The demand for finished metals continues fairly good, though not so urgent as last month.

Old Material.—While there is some difference in the ideas of dealers respecting prices on some items in the list, based on their stocks and commitments, it is a firm market and legitimately so, since there is a good demand for iron and steel scrap from consumers and considerable trading is going on between the larger local dealers. There are no offerings by the railroads reported and it is believed that their yards have been pretty well cleaned up for the present. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$17.50 to \$18.00
Old steel rails, rerolling.....	16.50 to 17.00
Old steel rails, less than 3 ft.....	16.00 to 16.50
Relaying, rails, standard sections, subject to inspection.....	25.00 to 25.50
Old car wheels.....	17.50 to 18.00
Heavy melting steel scrap.....	16.00 to 16.50
Frogs, switches and guards, cut apart.....	16.00 to 16.50

The following quotations are per net ton:

Iron fish plates.....	\$15.50 to \$16.00
Iron car axles.....	21.00 to 21.50
No. 1 railroad wrought.....	16.00 to 16.50
No. 2 railroad wrought.....	15.00 to 15.50
Railway springs.....	14.00 to 14.50
Locomotive tires, smooth.....	15.50 to 16.00
No. 1 dealers' forge.....	11.50 to 12.00
Mixed borings.....	8.00 to 8.50
No. 1 boilers, cut to sheets and rings.....	11.50 to 12.00
No. 1 cast scrap.....	15.00 to 15.50
Stove plate and light cast scrap.....	10.75 to 11.25
Railroad malleable.....	14.00 to 14.50
Agricultural malleable.....	12.00 to 12.50
Pipes and flues.....	11.50 to 12.00
Railroad sheet and tank scrap.....	10.50 to 11.00
Railroad grate bars.....	11.50 to 12.00
Machine shop turnings.....	10.50 to 11.00

During 1908 the manufacture of steel castings in St. Louis totaled the sum of \$18,500,000; railroad and street cars manufactured, \$9,000,000; plumbers' and steam fitters' supplies, manufactures and sales, \$7,500,000; sales of hardware (shelf and heavy), \$37,000,000.

St. Louis is becoming an important factor in the automobile industry. The first motor factory was established here in 1897. At the present time there are 21 manufacturers. During the year to date 2695 licenses have been issued in the city to the owners of automobiles.

The Quanah, Acme & Pacific Railway, which is being built west from Quanah, Texas, to Roswell, N. M., connects with the St. Louis & San Francisco at Quanah. When it is finished to Roswell a new and direct route between St. Louis and Kansas City and the Southwest will be obtained. The first section of the 275 miles of road will be opened for operation November 1.

A new electric railroad line is to be built from Mt. Vernon, Ill., to Winkle, thence to the Mississippi River at a point above Chester Ill. The line will be approximately 83½ miles long, built with low grades and laid with heavy steel rails.

The Youngstown Car Mfg. Company, Youngstown, Ohio, has secured a contract from a large industrial concern in New York which covers a complete installation of track, with an electric locomotive, special steel dump cars, &c. This is said to represent one of the largest and most complete installations ever contracted for in industrial car building lines. Among other contracts recently taken are the following: For a Chicago cereal manufacturer 206 steel dump cars; for shipment to South America, 20 large steel cars for hauling asphalt, the steel work of which is to be galvanized so as to prevent rust in the sea air; for Central America, 10 flat steel cars; for Canada, 15 steel cars; for a Mexican mine, 10 steel cars. The company is now operating its plant to full capacity.

Pittsburgh.

PARK BUILDING, October 13, 1909.—(By Telegraph.)

Pig Iron.—Reports that the Carnegie Steel Company had bought a large block of Bessemer iron are untrue, having evidently been circulated to help boom the market. The present steady demand for pig iron and the fact that consumers are anticipating shipments make the circulation of such reports absolutely unnecessary. It is believed that prices of pig iron are now as high as they should go, and that any further advances should be discouraged. Furnaces have a good profit at these prices, even with the higher prices of coke and prospective higher prices on ore. We quote Bessemer iron for this year's delivery at \$18.50 to \$18.75; malleable Bessemer, \$18; basic, \$17 to \$17.25; No. 2 foundry, \$17 to \$17.50, and gray forge, \$16, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton. No sales of moment have been made during the week.

Steel.—It is no longer a question of price but where to get steel. The producers of billets and sheet and tin bars are badly oversold and are steadily getting further behind in deliveries. An Eastern steel mill has been trying to buy some billets and bars from a local mill to help out on its contracts, but none of the local mills has any to spare. The Carnegie Steel Company has been asked by several of its customers to fix a price on sheet and tin bars for first quarter of next year, but so far has not done so. It is intimated that the price on sheet and tin bars for that delivery may be as high as \$30 at mill, but this is not confirmed. The quotation of \$28 on sheet bars in this report last week was an error and should have read \$27, several lots for prompt shipment having been sold in the first few days of this month at that price. In the present condition of the market it is almost useless to quote prices, as consumers who are not getting prompt deliveries of steel, and have to buy in the open market, must pay a premium to get it. Sheet bars, with specified time of delivery, have sold in good sized lots as high as \$28, and reports are current of small sales above that price. Bessemer billets for prompt shipment have sold at \$26 and \$27, at mill, full freight added to point of delivery. Open hearth billets for prompt shipment have sold at \$27, maker's mill, and forging billets are firm at \$29 to \$30, maker's mill.

(By Mail.)

A meeting of the Bessemer Pig Iron Association was held last week in Cleveland, at which an examination of the engagements of the furnace companies on pig iron for the balance of this year and the first quarter of next year showed that the association's furnaces have only a limited tonnage of Bessemer iron available for delivery over the balance of this year and into the first quarter of next year. A price of \$19 at Valley furnace on Bessemer iron for delivery in first quarter was virtually decided upon. The recent purchase of 41,000 tons of Bessemer iron by the Cambria Steel Company, of which 18,000 tons was for delivery this year on the basis of \$18 at Valley furnace, has pretty well cleaned up the available supply for this year, and the absolutely minimum of the market is now \$18.50 at Valley furnace, with some sellers asking \$18.75 and \$19. The feeling is very strong that pig iron is high enough, and that efforts should be made to keep the market from going any higher. The persistent efforts which seem to have been made by a few sellers of pig iron to boom the market are regarded by the conservative element in the trade as a mistake, and sure to result in a reaction. The situation in steel from the consumers' standpoint is unsatisfactory, all the mills being oversold and behind in shipments. High prices are being paid for billets and sheet and tin bars to mills that will guarantee deliveries, Bessemer billets having sold at \$27 and sheet bars at \$28 under these conditions. These prices, however, are considerably higher than consumers pay for billets or sheet bars who have contracts, and most consumers are covered in this way. The buying of finished material in the past week or two has not been quite as heavy as it was, but specifications are pouring into the mills at an unprecedented rate, and several of the leading steel interests have enough actual orders on their books to-day to take their entire output for the balance of this year, if they do not take another order. Deliveries on plates, structural material and steel bars are particularly in arrears. There has been some heavy buying in furnace coke for next year at \$2.90 to \$3 per net ton at oven, and some further large inquiries are in the market. The scrap situation is very strong, dealers being able to get top prices for such material as they are willing to sell.

Ferromanganese.—There is a good deal of inquiry and prices are firm. We quote 80 per cent. foreign ferro for delivery this year at \$43.50 to \$44, and for delivery in the first half of next year at \$45, seaboard, the freight rate to Pittsburgh being \$1.95 a ton. We note a sale of 50 tons of 80 per cent. for this year's delivery at \$43, seaboard, and 100 tons for next year at \$44.50, seaboard.

Ferrosilicon.—The demand is active and prices are

slightly higher. We quote 10 per cent. at \$23.90; 11 per cent., \$24.90; 12 per cent., \$25.90, and 50 per cent. at \$64 to \$64.50, f.o.b. Pittsburgh. We note a sale of 50 tons of 50 per cent. for this year delivery at \$64, delivered, Pittsburgh.

Muck Bar.—A prominent local consumer of muck bar has made a contract for 5000 tons, being 1000 tons a month from October to February, inclusive, on the basis of about \$29, Pittsburgh. We quote best grades of muck bar made from all pig iron at \$29 to \$30, prices depending on the amount involved and the deliveries.

Wire Rods.—Within the last two weeks several sales of Bessemer rods for delivery this year were made on the basis of \$31, Pittsburgh, but no more could now be obtained at this price. We quote Bessemer, open hearth and chain rods at \$32, f.o.b. Pittsburgh, and are advised that contracts offered by consumers at this price for delivery in first quarter and first half of next year have been turned down. We note several sales of screw stock rods at \$37 for delivery this year, and \$38 for delivery in first quarter of next year.

Skelp.—The demand for both iron and steel skelp is active, and prices are very firm, particularly on grooved and sheared iron plates. We quote: Grooved steel skelp, 1.45c. to 1.50c.; sheared, 1.55c. to 1.60c.; grooved iron plates, 1.75c. to 1.85c., and sheared iron plates at 1.90c. to 1.95c., all for ordinary widths and gauges, f.o.b. Pittsburgh.

Steel Rails.—The New York Central is about ready to place its contract for rails for next year's delivery, and it is stated that the order will amount to 225,000 to 250,000 tons. The Carnegie Steel Company has received an order from the Norfolk & Western Railroad for 13,000 tons of standard sections, for delivery next year, while its new orders and specifications against contracts last week were for about 3700 tons of light rails, the heaviest week that it has had for some time. We quote steel axles at 1.65c. to 1.70c., and splice bars, 1.50c., at mill, Pittsburgh. Light rail prices are as follows: 8 to 10 lb., \$32; 12 to 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 and 45 lb., \$27, Pittsburgh. These prices are for 250-ton lots and over, and for small lots premiums of 50c. per ton and more are being paid. We quote standard sections at \$28, at mill.

Plates.—Negotiations are under way for building 9 or 10 ore boats to go into commission next year. The steel car companies, the boiler shops and other consumers of plates are specifying heavily against contracts, and the leading mills are from six weeks to two months behind in shipments. Plates for reasonably prompt delivery have been sold at 1.55c. to 1.60c., Pittsburgh. We quote ¼-in. and heavier plates at 1.50c. to 1.60c., Pittsburgh, prices depending altogether on deliveries wanted by the buyer and the quantity involved.

Structural Material.—The McClintic-Marshall Construction Company has taken a contract for terminal work for the Michigan Central at Detroit, involving about 7800 tons, and the American Bridge Company has taken 1200 tons for extensions to mill buildings at the Homestead Works of the Carnegie Steel Company and 750 tons for additions to the Waverly, N. J., warehouses of the same company. Low prices are still being made by some of the steel fabricators, who have contracts in with the mills at 1.25c. to 1.30c. for plain material, and which have to be specified for before this year is out. These concerns are anxious to take out this material, and instead of figuring costs on to-day's prices for plain material are basing them largely on the prices at which they placed the contracts. Deliveries on plain material by the mills are very unsatisfactory to the fabricators, and this is also true of deliveries on steel bars. The American Bridge Company is operating its Ambridge, Pa., plant single turn, being unable to get material fast enough to operate double turn. It has upward of 400,000 tons on its books, but cannot turn out the maximum output. The largest job in sight is the proposed city bridge at St. Louis, bids on which are expected to be asked in the latter part of this month. We quote beams and channels up to 15-in. at 1.50c. to 1.60c., f.o.b. Pittsburgh, prices, as in plates, depending largely on deliveries wanted and the tonnage.

Sheets.—The American Sheet & Tin Plate Company is now operating 154 hot sheet mills out of 186 serviceable mills. The only important idle plant is the Aetna-Standard Works, at Bridgeport, Ohio, but no efforts have been made to start it. The buying of black and galvanized sheets and roofing sheets continues enormously heavy, and practically all of the mills are congested with business and are behind in deliveries. The scarcity in supply of sheet bars and the delay in deliveries by the mills on contracts are working against the independent sheet mills, who have to buy their bars in the open market. Some sales of sheet bars for delivery over the balance of this year have been made on the basis of \$28, at mill, and it is practically certain that bars for first quarter will be higher than that price. As yet the prominent makers of sheet bars have not announced their prices for first quarter delivery. Prices on blue annealed sheets, now in effect by the American Sheet & Tin Plate Company and other producers, are as follows: Nos. 3 to 9, 1.65c.; Nos. 9 and 10, 1.70c.; Nos. 11 and 12, 1.75c.; Nos. 13 and 14, 1.80c., and Nos. 14 and 15, 1.90c. One-pass box

annealed No. 28 black sheets are now 2.30c. and No. 28 galvanized 3.35c., at mill. We quote corrugated roofing sheets at \$1.60 per square for painted and \$2.85 for galvanized, 2½-in. corrugations. Jobbers charge the usual advances over these prices for small lots from store.

Tin Plate.—This week the American Sheet & Tin Plate is operating 160 hot tin mills out of 221 serviceable mills, an increase over last week of six mills. The contracts for tin plate entered by the mills since they opened their books for business for the first quarter of the year have been heavier than ever before in the history of the trade. Several tin plate makers, who have sold very heavily for first quarter, are now quoting on the basis of \$3.60 and \$3.65 for that delivery. We quote 100 lb. cokes at \$3.50 per base box, f.o.b. Pittsburgh, for the balance of this year and first quarter of next.

Bars.—Large consumers of bars, such as the carbuilders and steel fabricating interests, report that deliveries by the mills are very unsatisfactory and are getting worse. All the large steel bar makers are from six weeks to two months or longer back in shipments. Some heavy inquiries for steel bars are in the market for delivery in first quarter of next year, and a good deal of tonnage has already been booked. The mills are not actively seeking such business, but are inclined to take care of their customers. The demand for iron bars is also heavy; the Republic Iron & Steel Company, the leading producer, is operating all its Western plants to full capacity with the exception of the Toledo mill, which will start October 18, and the Massillon mill, which may not be started for some time. The local makers of iron bars, such as Lockhart, Zug and Brown & Co., have a great many orders on their books, and prices are very strong. Slightly better deliveries are obtainable in iron bars than in steel, and for this reason some steel bar business is being diverted to bar iron mills. We quote steel bars at 1.45c. to 1.50c. on contracts for delivery ahead, and 1.55c. to 1.60c. on orders for prompt shipment. Iron bars have further advanced, and while these sold last week at 1.60c., the market is now about \$1 higher, and we quote 1.65c., f.o.b. Pittsburgh. In the present condition of the market, prices on both iron and steel bars largely depend on specification and deliveries wanted.

Hoops and Bands.—Local makers report that new orders are heavy, and specifications against contracts are coming in freely. Some of the mills making hoops and bands that do not have their own sources of supply of steel are having trouble in getting deliveries of their raw material, and are hampered in operations to some extent. We quote hoops for forward delivery at 1.50c., and for prompt delivery at 1.60c. to 1.65c., at mill. Steel bands are very firm at 1.40c. to 1.45c. on contracts and 1.50c. to 1.55c. for prompt shipment.

Spikes.—Through the influence of a goodly volume of business offered by the railroads for next year, one or two leading makers have opened their books for contracts for first quarter delivery only, on the basis of \$1.75 to \$1.80, f.o.b. mill, and some business has been placed at these prices. For delivery through the balance of this year standard sizes of railroad spikes are held at \$1.70 to \$1.75, and small spikes at \$1.75 to \$1.80 in carload and larger lots, with an advance of 5c. for less than carloads. All the makers are filled up with business for the next two or three months.

Rivets.—Makers of rivets state that their principal trouble just now is getting deliveries of raw materials. A meeting of the rivet makers is to be held in New York next week, and it is not improbable that an advance of at least \$2 a ton may be made. As prices of raw materials have further advanced recently, the rivet makers state that higher prices on their product are justified. We quote structural rivets, ¾ in. and larger, at 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ½ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

Merchant Pipe.—In view of the steadily higher prices ruling for steel, and the difficulty in getting deliveries, some of the pipe mills are declining to make engagements for pipe beyond the next 30 days, believing that within a short time a further advance will be made. New business entered by several of the mills in September was the heaviest in any one month for nearly two years, and none of the mills is in position to take much for delivery within six weeks to two months. No large inquiries are in the market for line pipe, as it is now too late in the year to undertake large jobs of pipe laying. It is stated that A. M. Byers & Co., Inc., local makers of iron pipe, are now selling their product on the basis of 74 and 5 to the largest dealers. The official discount on black steel pipe, ¾ to 6 in., is now 80 and 5, and on iron pipe, ¾ to 6 in., 75 and 5 in carload and larger lots to the largest trade. It should be noted that these prices are absolutely minimum, and are only made to the large trade in carload and larger lots, jobbers charging the usual advances to the smaller trade for shipments from store.

Boiler Tubes.—The new demand for merchant tubes con-

tinues light, but the railroads are buying more freely of locomotive tubes, and the mills are entering more business than for some time. These orders still represent material needed mostly for repair work, but a further increase in the demand for locomotive tubes is expected, as some large sized contracts for locomotives have been placed and others are pending. The new discounts on steel and iron boiler tubes recently adopted are printed elsewhere in this issue.

Shafting.—A meeting of the shafting makers was held in this city last Friday, at which it was agreed to open order books for contracts for shafting for delivery in first quarter of next year on the basis of 55 per cent. off in carload and larger lots, and 50 per cent. off in small lots. This is an advance of two points in the discounts for delivery the balance of this year, which remain at 57 per cent. off in carload lots and 52 per cent. in less than carloads, delivered in base territory. The demand for shafting is unusually heavy; all the makers are running their plants full and have large orders booked.

Iron and Steel Scrap.—The situation in scrap continues very tight, and consumers are taking material about as fast as it is offered by the dealers and at full prices. The Baltimore & Ohio and the Central Railroad of New Jersey scrap lists closed October 10, and we are advised that prices paid by the buyers were higher than at any time in nearly two years. The lists of the Pennsylvania and Philadelphia & Reading closed on the 13th, and dealers have bid high prices to get the material offered. Heavy steel scrap is now held at \$18, minimum, for delivery at Sharon, Steuvenville, Monessen, Follansbee and Pittsburgh, delivery points, some dealers refusing to consider this price and holding their scrap at \$18.50. On other grades of scrap dealers quote about as follows: Cast iron borings, \$11.50 to \$11.75; bundled sheet scrap, \$16.25 to \$16.50; low phosphorus melting stock, 0.04 and under, \$21.50; No. 1 cast scrap, cupola sizes, \$17 to \$17.25; No. 2, \$16 to \$16.25; sheet bar crop ends at shipping point, \$19 to \$19.50; No. 1 railroad malleable scrap, \$16.75 to \$17; grate bars, \$14.25 to \$14.50; re-rolling rails, delivered at Cambridge and Newark, Ohio, \$18.25 to \$18.50; steel axles, \$22; locomotive axles, \$28 to \$28.50; iron axles, \$27 to \$27.50; No. 1 busheling scrap, \$16.50 to \$16.75; No. 2, \$13.50 to \$13.75; old car wheels, \$19 to \$19.25; machine shop turnings, \$13.25 to \$13.50; No. 1 railroad wrought scrap, \$18.50 to \$19. We note sales of 3000 to 3500 tons of heavy steel scrap at \$18, delivered; 500 tons of cast iron borings at \$11.50, and 800 tons of machine shop turnings at \$13.50. All above prices are per gross ton, f.o.b. cars, Pittsburgh, unless otherwise stated.

Coke.—The heavy rains of Monday night in the coke regions will help out a good many plants that were running short of water. The demand for furnace coke continues active, and the Lackawanna Steel Company is credited with having bought about 10,000 tons of coke per month over all of next year on the basis of \$3 per net ton, at oven. It is stated that the company is in the market for nearly double this amount of coke. Another furnace interest is credited with having bought 10,000 tons a month of standard furnace coke for all of next year on the basis of \$3.90 per net ton, at oven. Furnace coke for prompt shipment can be had at slightly lower prices and is held at \$2.75 to \$2.85 per net ton, at oven. Standard makes of 72-hour foundry coke for delivery this year are held at \$2.75 to \$3, at oven, and for delivery over first half of next year \$3 to \$3.50 per net ton, at oven, are being quoted. The output of coke in the Upper and Lower Connellsville regions last week was 422,819 tons.

The German Iron Market.

BERLIN, October 4, 1909.

After long waiting for an improvement in the iron market it seems now that the trade is at last on the upward wave again. From all sections of the iron industry better news has been arriving for several weeks. Buyers are more anxious to place contracts, while producers are less disposed to commit themselves at present prices for any considerable periods. Prices are moving upward steadily. At the latest meeting of the Düsseldorf Exchange price advances were more general and of larger size than previously.

The improvement in the market has been due chiefly to the rapid upward movement in the American market. The latter has not merely given the German market moral encouragement, which in itself has amounted to a great deal, but the strong situation on your side has already led to considerable buying for export to America. Not only pig iron scrap but also billets and some other rolled products have been bought for American account. There has even been one American order at least in structural steel for rapid delivery, a thing that had not occurred before for many years. The feeling in the market is that much better business with the United States will be done later on, in view of the fact that the consumptive demand there has developed recently with such remarkable force.

The pig iron market has undergone a notable improvement. The great mixed works, which had been offering iron in the summer for next year's delivery at remarkably low

prices, have stopped this policy. It is mentioned that all these big works have as much work for their furnaces as they are willing to take at present prices. Only the disconnected furnaces still complain of not being supplied with orders in satisfactory amounts. All the furnaces are demanding higher prices than a month ago. In the Rhenish-Westphalian District hematite foundry costs 57 to 58 marks, No. 1 foundry 56 to 57, No. 3 55 to 56, Luxemburg puddling 44 to 45, Luxemburg foundry No. 3 47 to 48. In the Siegerland region spiegeleisen (10 to 12 per cent.) costs 61 to 63 marks. These prices are for next year's delivery. The market for scrap is very firm; consumption is increasing, while supplies are running rather low.

In semimanufactured steel home consumers have covered their requirements for the rest of the year, taking somewhat larger amounts than usual, and not a few of them are urgent in calling for delivery of goods on order. The Steel Syndicate has not yet given out its prices for the first quarter of 1910, and it is thought highly probable that it will raise prices when the new list is made up. It issued an unusually good monthly report about a fortnight ago, showing a big increase in its orders. The report mentions improved business in steel rails for export. Foreign countries are also taking larger quantities of rails for mine equipment. The export market is also taking more structural shapes than hitherto. This applies to England as well as other countries.

The most interesting section of the market just now is that of bars. After many long and fruitless efforts to form some sort of organization in this section of the market, a loose price agreement has at last been agreed upon, nearly all the big establishments being parties to it. It has been agreed to take no orders at all for the present for delivery in 1910, from which fact it is evident that the mills expect to be able to enforce a higher scale of prices than now rules. The prices of bars have already undergone a marked improvement. At present few, if any, soft steel bars are sold at less than 100 marks, while prices as low as 94 marks for home delivery were heard of often in August, and still lower ones for export. The Association of Rhenish-Westphalian Wrought Iron Works last week voted to raise prices 2.50 marks, good till the end of next March.

The demand for heavy plates has grown brisker. Many of the mills are heavily stocked with orders, but some of them are still not adequately supplied with work. In boiler plates business is still slack. Ship plates for England are going off more freely. In thinner plates and sheets orders are also coming in more briskly, and consumers are disposed to order for longer periods, but prices remain unsatisfactory. The Association of Band Iron Mills last week added 2.50 marks to prices, after a similar advance had been made about a month ago.

Cincinnati.

CINCINNATI, OHIO, October 13, 1909.—(By Telegraph.)

Increased interest is shown in this market in all lines, particularly noticeable since the opening of the week. Relatively, coke shows the firmest tone, although some items in finished lines of iron and steel maintain the steadiness and strength that have marked the course of these commodities for several months. Machine tool builders are getting further behind on deliveries of the standard sizes, and dealers are getting some very good lists on which to estimate for deliveries of tools in general manufacturing establishments in the Central States.

Pig Iron.—The conviction that iron has about settled at a permanent selling base for the balance of the year and that any recessions are a very remote possibility has brought out some of the heavy consumers, who have not participated in the heavy buying movement of the past few weeks and who desire to get in on the allotments for next year. The largest inquiries are from St. Louis and Chicago territory and are for steel making irons. The leading agricultural machine manufacturing interest, which needs some Nos. 2 and 3 foundry, is said to be willing to take on 30,000 to 40,000 tons at an attractive price for the balance of this year and first half of next year. Low grade irons are still extremely scarce, and the very high price asked by the few furnaces which have any on their yards has frightened some of the pipe makers into a declaration that they will shut down their plants soon for three or four months, or until what they term prohibitive prices on low grade irons have been modified. A local dealer reports turning down a 500-ton order for forge at \$13.50, Birmingham, and others here are quoting \$13.75, Birmingham, as the minimum. There is some talk of the importation of foreign iron and some foreign interests are investigating the situation with that end in view. A St. Louis steel maker wants 10,000 to 15,000 tons of basic. Southern No. 2 is quoted at \$15, Birmingham, although there are reported some sales at \$14.50 for the remainder of the year. The \$15 price is quotable for first half deliveries. Northern irons are rather firm, at \$17, Ironton, for No. 2, the \$16.50 iron being apparently about exhausted. A large Chicago melter, who is credited with an

inquiry for 5000 tons of Southern basic, is said to have deferred consideration until after October 23. A local steel maker purchased last week 500 tons of ferromanganese for the first half at around \$44.50, Baltimore. A central Ohio maker of heavy hoisting machinery has bought 1000 tons of foundry, and a large agricultural implement manufacturer of northeastern Ohio has also bought a considerable tonnage. One of the two furnaces in the Ironton District that has been selling freely announces its withdrawal to-day. Charcoal irons are in demand, and a price of \$22, Southern furnace, is named. A 700-ton order for Pittsburgh territory was closed here to-day. The greater part of this iron is going into roll making. For prompt delivery and remainder of the year, based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$18.25 to \$18.75
Southern coke, No. 2 foundry.....	17.75 to 18.25
Southern coke, No. 3 foundry.....	17.25 to 17.75
Southern coke, No. 4 foundry.....	17.00 to 17.25
Southern coke, No. 1 soft.....	18.25 to 18.75
Southern coke, No. 2 soft.....	17.75 to 18.25
Southern gray forge.....	16.75 to 17.25
Southern mottled.....	16.25 to 16.75
Ohio silvery, 8 per cent. silicon.....	20.20
Lake Superior coke, No. 1.....	18.70
Lake Superior coke, No. 2.....	18.20
Lake Superior coke, No. 3.....	17.70
Standard Southern car wheel.....	24.25 to 25.25
Lake Superior car wheel.....	21.25 to 22.25

(By Mail.)

Coke.—The market is very strong and prices continue to show an advancing tendency. Local sales agencies do not quite agree with Connellsville reports, which place the price on first class furnace coke at \$2.60 to \$2.75. It is asserted here that the top price named cannot be done on spot furnace grades. There is much confusion in the ranks of both buyer and seller. The best that can be done in the southern Ohio district is \$3 per net ton, at oven, on best spot grades of the Connellsville product, and the contract price is about the same. On foundry brands the price ranges from \$3 to \$3.40, either spot or contract. Scarcity of water is troubling operators in the Wise county field. This coke is quotable at \$2.25 to \$2.50 for spot furnace and \$2.75 to \$3 for foundry, with a contract price of \$3. Pocahontas spot furnace is selling at \$2.25 to \$2.50; on contract \$2.40 to \$2.50.

Structural Material.—In shapes and plates a little more independence is noted among manufacturers, some holding rather firmly to the 1.50c., base, on carload and larger lots for immediate specifications, and on less than carload lots asking 1.60c. Deliveries are not better than from 60 to 90 days. A little more business in bridge material is coming out in this territory and a number of medium and small jobs for the railroads are being closed up.

Bars.—There is a large tonnage of steel bars moving through this district and largely for use in reinforced concrete work. While the price of 1.40c., Pittsburgh, is still obtainable, more are sold on the 1.50c. basis. Iron bars are stronger, and are selling around 1.50c. to 1.55c., at local mills, of which there are several in this territory.

Sheets.—It is rather difficult to secure a quotation on sheets, as it is not so much a matter of price as deliveries, and with the demand increasing values are being enhanced considerably. The principle of raw material costs is entering largely also into price making. The new price of 3.35c., Pittsburgh mill, for No. 28 galvanized is being maintained as far as can be ascertained, although mills in this territory are not governed by the official figures, but are rather regulated by delivery requirements. Local mills are not offering except in the case of bona fide inquiries, and are not promising deliveries inside of six to eight weeks. Roofing sheets are on the same basis and the prices announced as subject to change without notice.

Old Material.—Railroads in this territory are offering limited lots and securing high prices under the strong competition of dealers. An offering of 125 tons, comprising Nos. 1 and 2 wrought, malleable and miscellaneous scrap, was closed by the C. N. O. & T. P. last Friday, and the Big Four, Cincinnati Division, has also sold some. Local dealers pronounce business ruling quiet but that the tone of the market is very strong. There is a difference of opinion in the trade as to the market on leading items, but as nearly as it can be gauged prices are about as follows, delivered in buyers' yards, Cincinnati and southern Ohio:

No. 1 R. R. wrought, net ton.....	\$14.50 to \$15.00
Cast borings, net ton.....	8.50 to 9.00
Heavy melting steel scrap, gross ton...	15.50 to 16.00
Steel turnings, net ton.....	9.50 to 10.00
No. 1 cast scrap, net ton.....	14.50 to 15.00
Burnt scrap, net ton.....	10.50 to 11.00
Old iron axes, net ton.....	19.00 to 19.50
Old iron rails, gross ton.....	18.50 to 19.00
Old steel rails, short, gross ton.....	15.50 to 16.00
Old steel rails, long, gross ton.....	16.50 to 17.00
Relaying rails, 56 lb. and up, gross ton.	22.50 to 23.00
Old car wheels, gross ton.....	15.50 to 16.00
Low phosphorus scrap, gross ton.....	18.00 to 19.00

Cleveland.

CLEVELAND, OHIO, October 12, 1909.

Ore.—Shipments continue very heavy. There has been considerable chartering the past two weeks of vessel tonnage to move ore sold recently, and for the first time in two years sufficient lake traffic is being provided to keep all the boats busy. Ore firms are now pretty well covered with contracts for the balance of the season, and, while there has been some talk of an advance in carrying charges, none is expected in ore rates. All the ore firms are practically sold up for the season, and work in the mines is being pushed to get out all the sold ore before the close of navigation. It is not expected that any action regarding next season's ore prices will be taken within the next two months, but, as noted several weeks ago, it is believed that an advance of 50 cents a ton will be made. Prices at Lake Erie docks, per gross ton, are as follows: Old range Bessemer, \$4.50; Mesaba Bessemer, \$4.25; old range non-Bessemer, \$3.70; Mesaba non-Bessemer, \$3.50.

Pig Iron.—The foundry iron market has quieted down, but prices are firm. Local furnaces are adhering to \$18, at furnace, for No. 2, for any delivery, and are making some sales at that price for local delivery and nearby shipment. One local furnace sold about 1500 tons during the week at \$18 for No. 2 for the balance of the year and the first half in lots of 500 tons and under. In the Valley No. 2 foundry is quoted at \$17.25 to \$17.50 for the balance of the year and the first half, but the former price might be shaded for early shipment. Several furnace interests that have taken on considerable tonnage for the first half have withdrawn from the market, expecting an advance to \$18, Valley furnace. The majority of the smaller consumers in this district have covered for at least a portion of their first half requirements, but some of the larger consumers have as yet made no purchases for delivery after the first of the year. The demand for Bessemer iron continues quite active, and a local interest has inquiries aggregating 45,000 tons for delivery during the last, first and second quarters. This interest has advanced its asking price to \$19 for Bessemer iron for any delivery. The New York Air Brake Company is in the market for 5000 to 10,000 tons of foundry iron for prompt shipment and first half delivery. The only other inquiries of any size reported during the week are one from a Columbus manufacturer for 1000 tons, and one from a northern Ohio foundry for 500 to 1000 tons, all for first half. For the balance of the year we quote, delivered, Cleveland, as follows:

Bessemer	\$19.40
Northern foundry, No. 1	\$18.65 to 18.90
Northern foundry, No. 2	18.15 to 18.40
Northern foundry, No. 3	17.65 to 17.90
Southern foundry, No. 2	19.35
Gray forge	16.50 to 16.75
Jackson County silvery, 8 per cent. silicon	20.55

Coke.—Some contracts were closed during the week, but many consumers of furnace coke are holding off, expecting that with increased production prices will soon be somewhat lower. Prices continue very firm, with higher quotations on foundry grades. We quote standard Connellsville furnace coke at \$2.80 to \$3 per net ton, at oven, for spot shipment and balance of the year, and \$2.90 to \$3 on contract. Connellsville 72-hour foundry coke is held at \$3 to \$3.15 for balance of the year and \$3.15 to \$3.50 for first half delivery.

Finished Iron and Steel.—With mills well filled up for the balance of the year, and a very encouraging outlook for business for next year, consumers of steel bars, plates and structural material are anxious to cover for their first half requirements, and mills would have no difficulty in making contracts for a heavy tonnage were they disposed to do so. While mill agencies express no desire to make contracts, some are taking care of their regular customers with contracts for steel bars at 1.45c. to 1.50c., Pittsburgh, for delivery during the first quarter, and 1.60c., Pittsburgh, for plates and structural material. Specifications continue heavy and a good volume of current business is coming out for small lots for early delivery, for which consumers usually make no objection to paying premium prices. For early delivery steel bars are quoted at 1.55c. to 1.60c., Pittsburgh. One or two mills are in a position to take on a limited amount of plate tonnage for early delivery, and quote 1.50c., Pittsburgh, for immediate specifications; but sales in small lots for immediate delivery are being made at 1.60c., Pittsburgh, and local mills have advanced their price to the latter basis. The demand for plates is heavy. Orders for structural material in small lots show no falling off and in some cases consumers are paying 1.60c., Eastern mill, for immediate delivery, which means a premium of nearly \$4 a ton. Local contracts awarded during the week include a bridge for the Cleveland, Painesville & Eastern Railroad, 300 tons, to the King Bridge Company, and the Elks' Building, Cleveland, 190 tons, to the Republic Structural Iron Works Company. Ohio bridge building plants are now well filled with work, largely from railroads, and are getting better prices than prevailed a few weeks ago. Iron bars are firm, at 1.55c. to 1.60c., Cleveland, and orders are plentiful. The demand for

forging billets in car lots continues active, sales being made for prompt and balance of the year delivery at \$29 to \$30, at mill. The demand for light rails in car lots continues good.

Old Material.—Inquiries are very plentiful and considerable tonnage is being sold, but the volume of business is being checked somewhat owing to the fact that consumers are unwilling to pay the prices asked by dealers. Yard dealers are holding very firmly for prices that brokers say they are unable to pay and make sales to consumers at what the latter are willing to give. With the exception of an advance of 50c. a ton on railroad malleable, quotations remain stationary. The maximum price offered by local mills on heavy steel scrap is \$17.50, but many dealers continue to hold for \$18. The demand for cast scrap is heavy and the supply offered is somewhat scarce. Sales are reported at high prices. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails	\$17.50 to \$18.00
Old iron rails	20.50 to 21.00
Steel car axles	20.50 to 21.00
Old car wheels	17.50 to 18.00
Heavy melting steel	17.00 to 17.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	15.00 to 15.50
Railroad malleable	17.00 to 17.50
Light bundled sheet scrap	11.50 to 12.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	\$21.50 to \$22.00
Cast borings	8.75 to 9.00
Iron and steel turnings and drillings	10.50 to 10.75
Steel axle turnings	12.00 to 12.50
No. 1 busheling	14.00 to 14.50
No. 1 railroad wrought	16.50 to 17.00
No. 1 cast	15.00 to 15.50
Stove plate	12.50 to 13.00
Bundled tin scrap	11.00 to 11.50

Buffalo.

BUFFALO, N. Y., October 12, 1909.

Pig Iron.—The extreme activity which had characterized the market for the preceding two or three weeks has not been a distinguishing feature of the week just closed; but a large aggregate of new orders has been placed notwithstanding, and inquiries for over 25,000 tons have been received. Most of the pig consuming industries have been represented in these inquiries, such as cast pipe, radiator and implement manufacturers, railroad shops and jobbing foundries. A good many foundries who receive their supplies from this district are now busier and turning out a larger tonnage than ever before in their history. Coupled with this, however, there are still some foundries that are not yet up to their normal production, and in some instances are not inclined to do any buying for next year until after January 1. There has been a fair inquiry for malleable, with a good sized tonnage placed during the week. The demand for basic has been strong, but the supply scarce, the principal local producer being sold up to January 1 and beyond. Prices are substantially unchanged from last week. We quote as follows, f.o.b. Buffalo, covering the balance of year and first quarter:

No. 1 X foundry	\$17.00 to \$17.50
No. 2 X foundry	16.75 to 17.25
No. 2 plain	16.50 to 17.00
No. 3 foundry	16.25 to 16.50
Gray forge	16.00 to 16.50
Malleable	17.50 to 18.00
Bessemer	18.50 to 19.00
Basic	17.75 to 18.25
Charcoal	20.00 to 21.00

Finished Iron and Steel.—Business keeps up to a high level in all finished lines. A good many jobbers and large consumers are negotiating for contracts covering the first quarter and half of next year. The pressure for placing such contracts for bars, structural shapes and plates is very strong, with indications that prices quoted by the mills are hardening. Prices are also on the upward move for special grades of steel, such as spring and tire steel, toe calk steel, &c. The demand for black and galvanized sheets continues very active, and prices have an upward tendency. The pressure for contracts for forward deliveries for export to Canada is heavy at stiffening prices, and a large export business is being done in bars, plates and structural shapes. The local demand for structural material continues good. Plans are being prepared for a 13-story addition to the Hotel Statler, Buffalo, for which bids will soon be received calling for about 800 tons of steel. Bids will soon be received also for a car house for the Buffalo, Lake Erie & Western Traction Company, requiring a small tonnage. The General Fireproofing Company, Youngstown, Ohio, received contract for the concrete reinforcing bars for the new Spencer Kellogg Company's grain elevator, this city, about 700 tons. Contract for structural steel for two towers and bridge and machinery housing for this elevator, 500 to 600 tons, has not yet been let. Bids are to be received next week for structural steel for the C. M. Flickinger Company's wholesale grocery warehouse, 500 to 600 tons.

Old Material.—A fair volume of business has been transacted during the week, and the market is firm; but a somewhat easier feeling is prevailing, and a little natural

lull after the heavy buying movement which has been experienced during the past few weeks. The temporary comparative dullness does not, however, effect the optimistic feeling existing among the dealers as to the outlook for the future. There has been no particular change in prices during the week except for cast scrap, which has advanced slightly. We quote dealers' prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel.....	\$16.50 to \$17.00
Low phosphorus steel.....	21.00 to 21.50
No. 1 railroad wrought.....	17.50 to 18.25
No. 1 railroad and machinery cast scrap.....	16.00 to 16.50
Old steel axles.....	20.00 to 21.00
Old iron axles.....	25.00 to 25.50
Old car wheels.....	18.00 to 18.50
Railroad malleable.....	16.50 to 17.00
Boiler plate.....	14.50 to 15.00
Locomotive grate bars.....	12.50 to 13.00
Pipe.....	13.00 to 13.50
Wrought iron and soft steel turnings.....	11.25 to 11.75
Clean cast iron borings.....	9.50 to 10.00
No. 1 bushing scrap.....	14.00 to 14.50

New York.

NEW YORK, October 13, 1909.

Pig Iron.—The market has again become more active, among the inquiries under consideration being 10,000 tons from a railroad equipment foundry, 3000 tons from an electrical shop and a round lot from a group of malleable foundries. Some large lots of basic, too, have been placed. The report that these included a large quantity for one of the Eastern steel works of the leading interest is unfounded, the tonnage involved not exceeding 3000 tons. There is a very good run of small and medium sized orders, and buying for next year is confident. We quote New York prices as follows: Northern No. 1 foundry, \$19 to \$19.50; No. 2 foundry, \$18.50 to \$19, and No. 2 plain, \$18 to \$18.50, for delivery in 1909. Alabama irons are quoted on the basis of \$19 to \$19.25 for No. 2 foundry.

Steel Rails.—Buying by the Missouri Pacific and Norfolk & Western has added to the rail bookings for 1910 in the past week. Total sales reported in that time are around 100,000 tons, almost all going to the mills of the United States Steel Corporation, and only a small part being for open hearth rails. The recently reported requirements of Mexican roads have been increased by later inquiries received by the mills.

Structural Material.—The structural mills have been making new records of output lately and fabricating works are able to shorten somewhat the time required for the accumulation of the various descriptions of material needed for any job. Prices of plain material are firm, on the 1.60c., Pittsburgh, basis, and from \$1 to \$2 a ton more is paid for early delivery. A fair amount of fabricating work is being contracted for each week and a considerable number of projects are ahead, actual awards being delayed for one reason and another. The Norfolk & Western has awarded bridge work amounting to over 3000 tons, the American Bridge Company and the Pennsylvania Steel Company taking 1200 tons each, while the balance went to the Virginia Bridge & Iron Works, Roanoke, Va. The American Bridge Company will furnish 2500 tons of fabricated work for the new government building at New Orleans, also 1000 tons for a warehouse of the American Sugar Refining Company in the same city. In New York City the Cambria Steel Company will furnish 2000 tons of steel for an apartment house, the contract for which was taken by the Edward Corning Company some time ago. For the trolley viaduct work on Staten Island the Snare & Triest Company was low bidder, but the steel has not been let. Also pending are the Interborough Railroad yard work, 3500 tons; Pier 31, in Brooklyn, 1500 tons, and the New York building for the Automobile Club of America, 1600 tons. Bethlehem shapes will be used in an apartment house at 156th street and Riverside Drive, 200 tons, to be fabricated by the Hinkle Iron Company, and 650 tons of Bethlehem shapes will be required for the loft building at Hudson and Vestry streets for the Trinity Corporation, recently awarded to the Levering & Garrigues Company. It is expected that bids will be taken next month on the proposed free bridge at St. Louis, calling for 16,000 tons. We quote mill shipments of plain material, tidewater delivery, at 1.76c., while shapes cut to length are sold from stock at 1.90c. to 2c.

Ferroalloys.—We have been unable to confirm reports of sales of ferromanganese at low prices, and we know of some producers who are sold out for this year's delivery. A big Pittsburgh steel interest is said to be preparing to buy some large quantities of ferromanganese very soon, and this report has, if anything, stiffened the market, which is firm at \$44. Ferrosilicon is not in good demand, and can be had at \$62 to \$62.50, New York.

Bars.—A continued good demand is reported by Eastern bar iron manufacturers, who quote 1.55c. to 1.60c., tidewater, on ordinary bar iron and 1.60c. to 1.70c. in refined and test bars. Steel bars are quoted at 1.66c. to 1.71c., tidewater, but deliveries are steadily falling behind.

Cast Iron Pipe.—The city of New York will to-day open bids on another high pressure contract which will require 1200 tons of water pipe. The Connecticut Hospital for the Insane, Middletown, Conn., also opens bids to-day on 7300 ft. of 16 in. These are the most important open lettings at present in this vicinity. Manufacturers report a good demand now coming out for delivery next year. This character of business is being handled conservatively, as manufacturers are not disposed to take chances on the cost of pig iron next year unless they are able to secure much higher prices on pipe than now prevail. The general demand for early delivery is quite good. Prices are firm, with an upward tendency. Carload lots of 6 in. are quoted at \$25 to \$25.50 per net ton at tidewater.

Old Material.—While sales by dealers have not been large, the market continues strong. Dealers' bids on the railroad lists now coming out are made on the basis of full prices from their standpoint, but it is understood that they are having scant success in obtaining any of the material thus offered, indicating that the mills are bidding still higher prices. This is regarded favorably, as it shows that the large consumers are in need of the material and that they are establishing a higher range of values which will operate to the benefit of dealers' stocks a little later. The quotations given below on heavy melting steel scrap are nominal, as it is highly probable that not much could be picked up in this locality at such prices. The purchasing agency for the associated Eastern steel works is believed to be paying a higher price than dealers here are willing to buy at under existing conditions. A relatively strong demand is observed for wrought pipe and No. 1 railroad wrought, and these grades are now hard to get in this immediate vicinity. Local foundries are purchasing quite freely, as they are giving more attention to scrap by reason of the advancing prices of pig iron. Malleable cast is exceedingly scarce and is wanted. Quotations are as follows, per gross ton, New York and vicinity:

Re-rolling rails.....	\$16.50 to \$17.00
Old girder and T rails for melting.....	15.75 to 16.00
Heavy melting steel scrap.....	15.75 to 16.00
Relaying rails.....	22.50 to 23.00
Standard hammered iron car axles.....	24.00 to 24.50
Old steel car axles.....	21.00 to 21.50
No. 1 railroad wrought.....	18.50 to 19.00
Wrought iron track scrap.....	16.50 to 17.00
No. 1 yard wrought, long.....	18.50 to 17.00
No. 1 yard wrought, short.....	16.00 to 16.50
Light iron.....	11.00 to 11.50
Cast borings.....	10.50 to 11.00
Wrought turnings.....	12.50 to 13.00
Wrought pipe.....	14.75 to 15.25
Old car wheels.....	16.00 to 16.50
No. 1 heavy cast, broken up.....	15.00 to 15.50
Stove plate.....	13.00 to 13.50
Locomotive grate bars.....	13.00 to 13.50
Malleable cast.....	16.00 to 16.50

Metal Market.

NEW YORK, October 13, 1909.

Copper.—A readjustment in the price of lake copper may occur within a day or two. By that is meant that the leading sellers will make a positive announcement of what their price is, and that price, it is generally conceded, will be something below 13c., which is less than the quotations some have been making. This action will be taken, it is understood, to put an end to the ragged situation that has prevailed. Sellers of lake copper have been quoting various prices between 12.75c. and 13.25c.; resale lots, which were offered, but which have now been taken up, have been a factor in the situation. The report of the Copper Producers' Association, published elsewhere in this issue, was not encouraging, to say the least, although it was not entirely unexpected. The optimistic feeling which prevailed before the issue of the September statistics was not in evidence last week, and the only anticipation the trade had of the producers' statistics was to the effect that they would not help the situation. Exports have fallen off; so far this month 7879 tons have been sent abroad, but there is so much copper there at present that it is not thought that the diminution of exports will help the foreign market. It is estimated that in France and England there are at least 100,000 tons of copper in storage, and in other European countries, which do not give figures, a close student of the situation estimates there is perhaps another 100,000 tons. One large seller of copper, who has been making a vigorous campaign among the big consumers with a view to getting orders, and who was under the impression that this is a good time to buy copper, was informed by many of his buying friends that they were not interested in copper at the present time, and they gave the impression that they are well stocked. An interesting feature of the situation is the fact that casting copper is not particularly plentiful and there is some demand, one sale of 3,000,000 lb. having been reported during the week. The price of casting copper is very close to the price of electrolytic as a result, and sellers are quoting it at 12.87½c. It is certain that electrolytic copper can be bought at 12.75c. to 12.90c., and lake copper can be had in plentiful

quantities at 13c. From L. Vogelstein & Co. we obtain the following figures of German consumption of foreign copper from the months of January to August, 1909: Imports of copper, 109,334 tons; exports, 5289 tons; consumption, 104,045 tons, as compared with consumption during the same period in 1908 of 101,945 tons. Of the above quantity 100,192 tons were imported from the United States. In London to-day the market was steady, and spot copper sold for £57 7s. 6d., while futures brought £58 7s. 6d., and sales amounted to 400 tons of spot and 700 tons of futures.

Pig Tin.—There seems to be no end to the resale lots of pig tin offered, and there is more of it around than any one contemplated. As a result pig tin is freely offered below the cost of import, which puts the London houses out of the market. Altogether this makes the situation very unsatisfactory. The prices established during the week were:

	Cents.
October 6.....	30.50
October 7.....	30.45
October 8.....	30.40
October 11.....	30.30
October 12.....	30.20

These figures, as can be seen, show a declining market, and the resales may send it lower. Although yesterday was a holiday in some quarters, enough pig tin was sold during the early period of the day to establish a price which was so low that sellers were glad to take advantage of the situation and most of them declared a half-holiday and shut down at noon. The London market is steady and spot tin was sold there to-day for £137 7s. 6d. and futures for £138 17s. 6d. The sales amounted to 100 tons of spot and 530 tons of futures.

Tin Plate.—Tin plate is decidedly scarce. The leading interest is said to be sold out for at least two months ahead and another advance is looked for shortly. Independent mills are being besieged by buyers from all parts of the country, and many of the inquiries come from new customers, which goes to show that they have been unable to obtain plates from their regular source of supply. The can manufacturers are buying, the biggest inquiry coming from the leading can manufacturing company. The smaller can makers show a disposition to wait for a time. The market in foreign tin plates has been strengthened and imports of Swansea plates are increasing; 14 x 16 I C coke plates in Swansea are bringing 12s. 6d., f.o.b. Swansea, which is a material advance over the price of last week. In this market the price for 100 lb. I C coke plates is \$3.74.

Lead.—Lead has been quoted in New York during the last week as low as 4.35c., although the American Smelting & Refining Company continues to keep its price at 4.40c. It is certain that lead can be bought from the outside interests at 4.37½c., and a good sized order would probably result in a quotation at 4.45c. Lead is plentiful and in poor demand.

Spelter.—Spelter continues firm, being in better demand than other metals. Perhaps one reason for this is that there is little or no inducement for speculators to dabble in the situation, but the reason advanced by the producers to the effect that it is costing only what it should is taken for granted by many. The price of spelter is firm at 5.90c., and we hear that some sales at 6c. have been made.

Sheet Zinc.—As a result of the advance in the price of spelter, sheet zinc has again gone forward and on October 9 it was announced that the price would be \$7.75 for 100 lb., less the usual discount, f.o.b. cars at the works.

Antimony.—The situation is unchanged. Hallett's is 8.30c. and Cookson's 8.50c. Other brands are 7.25c.

Old Metals.—The market is weak. The following dealers' selling prices represent present conditions:

	Cents.
Copper, heavy cut and crucible.....	12.75 to 13.00
Copper, heavy and wire.....	12.25 to 12.50
Copper, light and bottoms.....	11.50 to 11.75
Brass, heavy.....	9.00 to 9.25
Brass, light.....	7.25 to 7.50
Heavy machine composition.....	11.75 to 12.00
Clean brass turnings.....	8.25 to 8.50
Composition turnings.....	9.50 to 9.75
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.90 to 3.95
Zinc scrap.....	4.15 to 4.25

Iron and Industrial Stocks.

NEW YORK, October 13, 1909.

The stock market has been under quite severe pressure the past week, the dominating influence having been the rise in interest rates on money, which has necessitated the curtailment of loans by banks. Considerable liquidation has therefore occurred all along the line, and this has been specially noteworthy in United States Steel stocks. Transactions in United States Steel common have been very large, on a steadily declining market, the number of shares traded in each day having been close to one-half of the total reported on the New York Stock Exchange. The lowest price for the week was reached on Monday, when 85¼ was touched. The range of prices on active iron and industrial stocks from Thursday of last week to Monday of this week, inclusive, was as follows:

Allis-Chalm., com..	14¾-15¼	Railway Spr., com.	46-48¾
Allis-Chalm., pref..	51¾-54¼	Railway Spr., pref.....	108
Beth. Steel, com...	33-35¼	Republic, com.....	45¾-47¼
Beth. Steel, pref...	68-68¾	Republic, pref.....	105¼-106¾
Can, com.....	12¼-12¾	South. I. & S., com.	18¼-19¼
Can, pref.....	81-83¾	South. I. & S., pref.	51-51¾
Car & Fdry, Com...	68-71	Sloss, com.....	90-93¾
Car & Fdry, pref...	118¾-119	Sloss, pref.....	90-93¾
Steel Foundries...	59¼-60¾	Pipe, com.....	31¾-32¼
Colorado Fuel....	43¼-45¼	Pipe, pref.....	85¾-86
Gen. Electric.....	162-167	U. S. Steel, com...	85¾-91¼
Gr. N. ore cert....	78-82¾	U. S. Steel, pref...	126¼-129¼
Int. Harv., com...	95-95¾	Westinghouse Elec.	85¾-87¼
Int. Harv., pref...	123¼-124¾	Va. Iron & Coal...	70-71¼
Int. Pump, com...	47¼-47¾	Chi. Pneu. Tool...	30-32
Int. Pump, pref...	88¼-90¼	Am. Ship, pref.....	111
Locomotive, com...	57¼-60¾	Cambria Steel.....	45¾-47¼
Locomotive, pref...	115	Lake Sup. Corp....	27-30¾
Nat. En. & St., com...	20	Warwick.....	11¾-11¾
Pressed St., com...	45¾-49	Crucible St., com...	13¾-14¾
Pressed St., pref...	104-105¾	Crucible St., pref...	82¾-83¾

Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 87, preferred 127¼, bonds 105½; Car & Foundry common 68¾, preferred 118½; Locomotive common 58, preferred 115; Steel Foundries 58½; Colorado Fuel 44¼; Pressed Steel common 45¼, preferred 104; Railway Spring common 46; Republic common 45¼, preferred 105; Sloss-Sheffield common 90¼; Cast Iron Pipe common 31½, preferred 85½; Can common 12¾, preferred 81.

Iron and Steel Bonds.

Chisholm & Chapman, 18 Wall street, New York, report the following quotations:

	Bid.	Asked.
Bethlehem Steel 1st ext. 5s, January, 1926.....	89	90¾
Bethlehem Steel purchase money 6s, August, 1908.....	117	117
Buffalo & Susquehanna Iron 1st 5s, June, 1932.....	99¾	100
Buffalo & Susquehanna Iron deb. 5s, January, 1926.....	96	96
Dominion Iron & Steel 5s, July, 1929.....	96¼	97¼
La Belle Iron 1st 6s, December, 1923.....	104¼	104¼
Lackawanna Steel 1st 5s, April, 1923.....	98¼	98¾
Maryland Steel 1st 5s, February, 1922.....	102	103
Pennsylvania Steel 1st 5s, November, 1917.....	103	103
Pennsylvania & Maryland Steel Co. 6s, Sept., 1925.....	109	110¼
Republic Iron & Steel 1st 5s, October, 1934.....	101	101¾
Sloss Iron & Steel 1st 6s, February, 1920.....	95¾	96¾
Sloss Iron & Steel consol. 4¼s, April, 1918.....	95¾	96¾
Jones & Laughlin 1st 5s, May, 1939.....	101¾	102¾

United States Steel Corporation.

Collateral Trust 5s, Series A, C, E, April, 1931.....	114¾	115¼
Collateral Trust 5s, Series B, D, F, April, 1931.....	114¾	115¼
Sinking Fund 5s, April, 1963.....	103¾	105¾
Union Steel 1st 5s, December, 1952.....	105	105¾
Clairton Steel 5s, 1908-1913.....	100	100
St. Clair Furnace 1st 5s, 1910-1939.....	100	100
St. Clair Steel 1st 5s, 1908-1926.....	100	100
Illinois Steel deb. 5s, January, 1910.....	100	100
Illinois Steel 5s, April, 1913.....	100	101

All bonds quoted "and interest."

Dividends.—The International Steam Pump Company has declared the regular quarter dividend of 1½ per cent. on the preferred stock, payable November 1.

The American Rolling Mill Company, Middletown, Ohio, has declared a quarterly dividend of 1¼ per cent. on the preferred stock and 3 per cent. on the common stock.

Conferences of Machinery Dealers' and Manufacturers' Associations.

The Executive Committee of the American Supply and Machinery Manufacturers' Association will meet at Atlantic City, N. J., October 15, when most of the members of the committee will be in attendance there at the conventions of the American Hardware Manufacturers' Association and the National Hardware Association. It is probable also that the executive committees of the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association will be in conference at Atlantic City at the same time.

Electric Furnaces at the Sault.—It is announced that three electric furnaces of the type employed in the manufacture of pig iron at the Domnarfvet Works in Sweden, have been contracted for by the Lake Superior Corporation for installation at Sault Ste. Marie, Ontario. The statement was made by P. R. Cobb, in the discussion of a paper on the Grönvall-Lindblad electric furnace at the recent meeting of the Iron and Steel Institute in London. This furnace was described in the report of Dr. Eugene Haanel, Canadian Director of Mines, as given in *The Iron Age* of September 16, page 831.

The Navy Department has decided to equip both of the 26,000-ton battleships with Parsons turbines. The Arkansas will be built by the New York Shipbuilding Company, Camden, N. J., and the Wyoming by the Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa.

The Machinery Trade.

NEW YORK, October 13, 1909.

Builders of machine tools who came here to attend the convention of the National Machine Tool Builders' Association occupied the attention of machinery merchants the greater part of the past week. Practically all the members of the association, with the exception of those whose main offices are adjacent to New York, are represented in this territory, and the convention gives an excellent opportunity for the dealers and builders to get together and discuss important matters affecting both. In view of the expanding trade, the great difference in the demand for tools in the East and West and the probable extension of deliveries at an early date, merchants are eager to secure as much information as they can from the builders concerning conditions of trade. In this market machinery houses have little to complain of, though the demand has not yet reached that of a normal year. It is as yet irregular and is not strong enough to furnish a steady volume sufficient to give all a good share. The past week with some houses was not as productive of either inquiries or orders as the previous few weeks, and no large projects were brought forward that will necessitate the purchase of large quantities of mechanical equipment. Some large orders for machine tools, principally for automobile plants, are, however, likely to be closed at an early date. Sales sheets for September show a larger volume of business transacted than that for August.

Many machine tool builders who attended the meeting of the National Machine Tool Builders' Association visited the trade here on Monday and most of them declared business to be unusually good. The general opinion among them was that with the increasing prices of raw material and an increasing scarcity of labor there will shortly be an advance in the price of machinery. Some of the visitors complained that they were unable to get mechanics enough to supply their needs and many of them are paying advanced wages. From the trend of their conversation dealers decided that an advance in machine tools is imminent.

Plans are being prepared under the direction of Leonard Waldo, 49 Wall street, New York, for machinery that will be required for the large plant the Gillette Safety Razor Company, 18 Tremont street, Boston, Mass., proposes to erect at Evergreen and Frelinghuysen avenues, Newark, N. J. Howes & Morse, architects, 19 West Thirty-eighth street, New York, are completing the building plans, and it is thought that construction work will be begun shortly. The plant will include a large brick fireproof one-story building, of the saw tooth style of architecture, and mill construction, which will be 80 x 200 ft., but other buildings will be erected later on, and eventually the company will occupy all of the extensive tract it has in Newark, which measures 900 x 1000 ft. At first a power plant to develop about 500 hp. will be installed, together with much in the way of special automatic equipment adaptable for the construction of safety razors. Mr. Waldo, it is understood, has all of the machinery details in hand, and from all accounts no contracts have as yet been let; though figures have been asked on the grinders.

The Delaware & Hudson Railroad has inquiries in the market for a few machines for its Green Island shops, near Troy, N. Y. The company has had under consideration for some time the erection of new shops at that place, and as soon as active work is started on these it is likely that the road will come into the market for considerable machinery.

It is reported that contracts for the extension of the Franklin and Fairfield division of the New York Central Railroad from Brookville to Clearfield, Pa., will be awarded shortly after the first of the year. Officers are said to have completed an inspection of the road for the purpose of selecting a site for the new shops and yards, and it is believed that they will be located near Du Bois, Pa.

J. H. Blanchard, Long Island City, N. Y., who recently completed a seven-story brick building, intends to erect another structure on Borden avenue, which will cost about \$200,000 and will be of brick, 146 x 262 ft., five stories. It is probable that construction work will not be started until the early spring.

Orders have been placed for the machinery to equip the new addition to the plant of the Auto Press Company, College Point, L. I. The building will be about 60 x 100 ft.

The McKinnon Chain Company, recently incorporated at Buffalo, N. Y., with a capital of \$1,000,000, to manufacture electrically welded chain by the McKinnon patent process, has purchased a 5½-acre site on the New York Central and Erie railroads and the Erie Canal at Tonawanda, N. Y., and has let contract for a manufacturing plant. The main building will be 80 x 304 ft., of structural steel, brick and concrete, with power house 30 x 40 ft., of the same construction.

Lachan E. McKinnon, president of the McKinnon Dash Company, Buffalo, is president of the new company.

The Otis Elevator Company, Buffalo, N. Y., is completing plans for a large foundry building to be added to its plant at Grider street and the New York Central Railroad Belt Line.

The United States Lighting & Heating Company, New York, has acquired a site of 18 acres at the north end of Niagara Falls, N. Y., on the lands of the Hydraulic Power & Mfg. Company, and will at once commence the construction of a large plant for the manufacture of electrical appliances, chief among which will be lighting systems for railroad trains and storage batteries for automobiles and commercial trucks. Contracts for the furnishing of Niagara power have been entered into with the Hydraulic Power & Mfg. Company.

The estimate of appropriation required for work on the Panama Canal for the fiscal year beginning July 1, submitted to the Secretary of War by the Isthmian Canal Commission, indicates that a great quantity of material and supplies will be required. Of the amount asked for \$20,218,000 is for material and supplies to be used in the construction work.

The Board of Water Supply, New York, will receive bids until October 20 for contract No. 55 for the construction of portions of the Croton and Kensico division of the Catskill aqueduct. The work includes eight tunnels on the hydraulic gradient, aggregating about three miles in length, 17 ft. high and 13 ft. wide inside; about 625 ft. of Putnam siphon of reinforced concrete 16 ft. in diameter; about five miles of plain concrete conduit; a by-pass aqueduct, the influent and effluent gate station and aeration works of the Kensico reservoir and other accessories. The work is located in the town of Mt. Pleasant, Westchester county.

Chicago Machinery Market.

CHICAGO, ILL., October 12, 1909.

Recovery from the depression that fell with paralyzing effect upon the machine tool trade in 1907 has rivaled in rapidity the decline of that epochal period. Theoretically, and, according to precedent, this industry should be the first to wane and the last to rise in such a crisis as that through which the country has just passed, and but for the unforeseen influence of automobile building with its phenomenal growth and development, this would doubtless have held true in the present instance. Sustained by the expanding requirements of this, as yet, unmeasured force, the demand for machine tools has kept pace with, and has even anticipated renewal of activity in other lines of manufacture instead of trailing in their wake as was expected. While in the past week no individual inquiries of exceptional size have engaged the attention of the trade, business as a whole has held up to the high average established in recent weeks. A feature that is regarded with satisfaction by manufacturers and dealers is that prices are being more evenly maintained. Eagerness for business no longer extends to the making of radical concessions to secure it. Some advances have been made on the more active lines, and, owing to increased costs of material and labor, coupled with a growing scarcity of the latter, other advances of more comprehensive scope are contemplated.

Plans are being prepared by the Arnold Company, Chicago, for the construction and equipment of shops at Shreveport, La., and improvements at other points for the Kansas City & Southern Railroad. Bids on the tools and machinery equipment will be called for as soon as plans and specifications have been completed.

The Minneapolis Motor & Truck Company, Minneapolis, Minn., recently incorporated with a capital stock of \$500,000, will erect a plant for the manufacture of gasoline motor trucks of 1, 3 and 6 ton capacity, driven by three-cylinder two-cycle engines. The plant will consist of a three-story and basement building, jig and pattern house, foundry, 50 x 140 ft.; blacksmith shop, metallurgical chemist's laboratory, and heating plant. Motive power will probably be supplied by electrical current from an outside source, which will be applied largely through independent motor drives.

As indicating the degree of improvement that has taken place in demand for motive power equipment, it is noted that contract boiler shops are better supplied with work than they have been at any time within the past two years. The Lyons Boiler Works, at De Pere, Wis., with a capacity of 10,000 hp. per month, is running full on double shift, and inquiries coming in promise continued activity at this rate. Plans have been prepared for extension of the works, but owing to the lateness of the season, it is not likely that the contemplated improvements will be undertaken before next spring.

The branch office of the Sullivan Machinery Company,

Chicago, heretofore located at 1 South Twentieth street, Birmingham, Ala., has been removed to 1227-1228 Brown-Marx Building. The new quarters provide better facilities for the prompt attention to inquiries relating to the company's products, which include air compressors, coal mining machines, rock drills, &c.

The Tandem Gas Engine Works, South Houston, Texas, has been purchased and taken over by the Texas Engine & Mfg. Company, organized by D. R. Jamerson, A. Dubuque and L. A. Pitts. The new company will manufacture a line of gas and gasoline engines and will enlarge the present plant.

Plans are being prepared by the engineers of the Progress Company, Murray City, Utah, for the installation of another hydroelectric plant on the big Cottonwood River. The proposed installation contemplates the use of several thousand feet of pipe lines, in addition to water turbines, electric generators and auxiliary equipment capable of developing several thousand horse-power. Plans now being drawn will not be ready for the acceptance of bids on machinery and material for some time yet.

The Temple Ice & Refrigerator Company, Temple, Texas, is contemplating the installation of an additional unit of 50 tons capacity in its plant, and possibly other improvements.

A contract for the erection and equipment of a 5000-kw. power station at Gilchrist, Ill., for operation of the Rock Island Southern Traction line, now in course of construction, has been let to the Knott Engineering Company, Chicago. The equipment will include a Westinghouse-Parsons steam turbine, Babcock & Wilcox boilers, Leblanc condensers and ash handling machinery, all of which have been purchased. The only equipment yet to be supplied are the heaters and piping.

Arrangements are being made by the Jennings Refrigerating Company, Jennings, Okla., to erect a concrete building for the installation of a 10-ton ice plant, which it is intended to have in operation by March 1.

Cincinnati Machinery Market.

CINCINNATI, OHIO, October 12, 1909.

Reflecting a consensus of opinion, gathered from many sources of machine and machine tool building, the trade pace of the week has been normal; neither better nor worse. Inquiry, however, is of a considerably better tone. The future outlook is exceedingly bright from every viewpoint, and every line of tools, with the possible exception of the heavier planers, radial drills and lathes, shows increasing demand daily. A few builders of standard tools might perhaps promise immediate delivery on some sizes; this would be particularly true of shapers, although not all establishments making this line in this field could do so. The best that can be done, on an average, with lathes, milling machines, boring mills and the like is from 4 to 12 weeks. Workmen of the desired qualifications are still in demand, and the automobile builders continue to offer higher than market wages for machinists suitable to their purpose. The dealers all report good business the past week, sales running in small lots of tools generally, but nearly all of the better standard makes and improved types.

The ice machine business is showing unusual activity for this season of the year, as comparatively little is generally ordered until the later winter months. The Triumph Ice Machine Company reports inquiries good for its line of machinery, and the other branch of its business, known as the Triumph Electric Company, has experienced a gradually increasing demand for the medium and small sized units.

The Cincinnati Industrial Bureau will act as host, as usual, this year to a trainload of representative citizens who will spend the day inspecting the large plants on the line of the Norfolk & Western Railroad and in the northeastern section of the manufacturing suburbs. Secretary and Manager Will L. Finch is busy with the details of the affair, which is scheduled for October 26. So popular have these annual trade excursions become that prominent men and manufacturers from nearby cities and the neighboring States are accepting invitations and each succeeding year the necessity for a larger special train is apparent.

Another extensive improvement is that just decided upon by the directors of the American Valve & Meter Company. The company will erect immediately a \$25,000 addition to its large plant at 1135 Gest street. Through Dwight S. Marfield, attorney, the company has acquired a piece of land on Court street, with which, when improved, it will have a building with frontage of 110 ft. and depth of 90 ft. The addition will be of reinforced concrete and three or more stories in height, and is expected to be completed and ready for occupancy early in the new year. The company is engaging largely in the manufacture of railroad supplies, for which the demand is steadily increasing. There will

be some new tools required, and a modern gas engine equipment for power.

An incident of the late week was the incorporation of the American Laundry Machinery Company, with a capital of \$100,000, which will soon be largely increased. The incorporators are Ethen B. Stanley, Robert M. Burton, Leonard S. Smith, Watkin W. Riley, Hiram D. Peck and Charles A. Hinsch. All are prominent Cincinnatians, Mr. Hinsch being the president of the Fifth-Third National Bank of Cincinnati. The capital stock is to be divided into 750 shares of common and 250 of 7 per cent. preferred stock, the latter to be redeemed July 1, 1912, at \$125. The company manufactures laundry machinery as a leader, and controls by purchase patents incident to the business. The American Laundry Machinery Mfg. Company is now a New Jersey incorporation. The change is a dissolution and surrender of the New Jersey charter, and the transfer of the assets to the new Ohio company. The headquarters will be in Cincinnati, where one of its largest plants is located at Norwood, a suburb.

The new foundry of the Peck-Williamson Heating & Ventilating Company, recently moved from Wellston, Ohio, to Cincinnati, is in operation. It is a part of the new Oakley colony, which promises in time to be one of the largest colonies of tool and machinery manufacturing in the country.

The F. J. Brinkman Ornamental Iron & Wire Works Company, with a plant on Corwine street, Cincinnati, will be incorporated with a capital stock of \$10,000, under the name of the F. J. Brinkman Mfg. Company.

The A. T. Nye & Son Company, Marietta, Ohio., manufacturer of stoves, gas heaters and heating appliances, will in the early spring erect a large addition to its present plant. The company recently installed a number of labor-saving and economic devices in its foundry.

Cleveland Machinery Market.

CLEVELAND, OHIO, October 12, 1909.

The volume of business done by the local machinery houses the past week shows some falling off. Orders continue to come quite plentiful, but they are mostly for one or two tools. The decrease in sales is due largely to the fact that very little business is now coming from the automobile industry, and orders from other sources have not increased sufficiently to keep up the average of the past three months. Makers of all kinds of machine tools used in the automobile trade are being crowded for deliveries, and it is difficult to secure early shipment from nearly all the makers of these lines of tools, but prompt deliveries can be secured on tools not used extensively in the automobile industry. The demand for additional machine tool equipment from general manufacturing industries is showing an improvement. Manufacturing plants in metal working lines are now nearly all running at full capacity, and with all the machinery in operation. Some of the plants are placing orders for a small amount of additional equipment. Orders are also beginning to come from some of the tool making plants that are being taxed to the utmost of their present capacity. Some small orders are coming from the railroads, but business from this source has not picked up as fast as had been expected. There is a good demand for small tools for new garages, but not many other new buyers are appearing in the market. The demand for electrical equipment for new power plants or additions is very good. The demand for second-hand machinery continues quite active, and good prices are being secured for used tools.

With the local machine tool builders conditions continue highly satisfactory. Orders for drill presses and automatic machinery are particularly heavy. Not as large orders are being received as when the automobile trade was in the market, but the buying has become more general and numerous small orders are being received. A number of the local plants not only have all the orders booked that they can fill this year, but they have a good volume of orders on hand for delivery early next year. A number of the plants are being run overtime and some business is being turned down because deliveries cannot be made as desired.

The Canton Drop Forging & Mfg. Company, Canton, Ohio, expects soon to begin the erection of a machine shop, plans for which have not yet been prepared. The company is operating its plant 22 hours a day and reports enough orders on hand to keep it busy until January 1.

The Standard Tool Company, Cleveland, maker of twist drills, reamers, &c., reports that it is crowded with orders. The company is running its plant at full capacity and some of the departments are being run overtime. The company made a large quantity of its goods for stock during the period of depression, and it now finds that it acted wisely in

accumulating this stock and preparing for the heavy volume of business that is coming in.

The Kanneberg Roofing & Ceiling Company, Canton, Ohio, reports a large amount of work on hand in all its departments. The company has recently commenced the manufacture of sheet metal fronts for moving picture show rooms, for which it is receiving a large number of orders, some coming from all parts of the world. The company has also recently placed on the market a new one-piece galvanized iron washboard, which is meeting with a great deal of favor among the trade.

The Empire Novelty Company, Canton, Ohio, recently organized with a capitalization of \$60,000, has let contracts for the erection of a manufacturing plant, which it expects to have ready for operation in January. The company will manufacture sheet metal toys.

The Massillon Foundry & Machine Company, Massillon, Ohio, reports that orders for the Lane drop hammer are coming in in a very satisfactory manner, and that it now has enough orders on its books to keep it busy until nearly the first of the year.

The Sparks-Withington Company, Ltd., Jackson, Mich., maker of pressed steel products, is building a large new manufacturing plant. The building is of reinforced concrete, one story, with saw tooth roof, 70 x 300 ft., with a bay 30 x 105 ft. The work is in charge of Burchard & Case, consulting engineers, Cleveland.

The Foote-Burt Company, Cleveland, reports that the heavy demand for drill presses continues and orders are being taken for delivery well into next year. The company is running its plant at full capacity and overtime.

The Osborn-Mfg. Company, Cleveland, is well filled with work in all its departments and in running its plant at full capacity. The company reports a heavy demand for power brushes for cleaning castings, &c.

The Brown Automatic Hose Coupling Company, Cleveland, has been incorporated with a capitalization of \$30,000 by E. L. Brown, Charles Eisele, P. L. Andrews and others. The company intends to place on the market a new air hose coupler.

The Webster Electric Company, Tiffin, Ohio, is buying a small amount of machine tool equipment and will begin the manufacture of automobile parts.

The Cleveland Car Company, through Warren Bicknell, receiver, has placed an order with the Kuhlman Car Company, Cleveland, for 25-street cars, and will probably buy some additional equipment in the near future.

Milwaukee Machinery Market.

MILWAUKEE, WIS., October 12, 1909.

The machine tool trade continues brisk and manufacturers in all of the metal working lines report a good demand for their products. It is estimated by competent authorities that during the coming calendar year the consumption of iron and steel in local industries will be at least 15 to 20 per cent. greater than for any similar period, and may range very much higher. Probably not more than one-third of the increase will take the form of pig iron; but will consist rather of output of the mills, fabricating plants and foundries, as well as of the shops, located elsewhere, in which parts or fittings for Northwestern-built machinery are produced.

With preparations for increased activity all along the line, manufacturers in Wisconsin and other Northwestern States are not only strengthening their hold upon such territory as they now occupy, but have also been busy of late in casting about for new fields to invade. Among these, encouraging prospects are offered for the increased use of gas engines both in large and small capacities. Advices received here from various parts of the country indicate that one of the most promising of future applications for these machines will be found in operating pumps for water works stations. Inquiries for prices on gas driven units are increasing in frequency and recommendations made by manufacturers in this section that such units be substituted for uneconomical types of steam driven pumps are being considered with a degree of thoroughness such as has never before been generally apparent. The same is true, although to a lesser extent, of compressors, blowers and large ventilating fans.

Among sales of motors and controllers, particularly of the latter, some of those made recently have been commented upon by the manufacturers as indicating the increasing extent to which hoists, tipples, &c., are coming to be electrically operated in plants of all kinds handling ore, coal, rock and other heavy materials in bulk. Contrivances which enable the movement of industrial cars and larries to be automatically controlled, or at least directed from a central point, are also in considerable demand.

Another feature of significance observable here is the growing tendency to substitute lifting magnets for manual labor in handling iron and steel. Indications are that the

number of magnets now in use will be trebled or quadrupled within a relatively brief period, and the field for the production of this apparatus in future holds forth promises that are very encouraging to the builders.

The manufacture of auto trucks is coming to be a large industry here and the two concerns turning out complete vehicles for industrial purposes have so many orders in hand that a third company is likely to enter competition with them in the near future. There are already a number which make a specialty of various parts.

During the recent visit of the Japanese Commercial Commission no more interesting exhibit of the city's industrial enterprise was made than that shown by the West Milwaukee car and locomotive building shops of the Chicago, Milwaukee & St. Paul Railroad. These now present a scene of great activity and are being pushed to their full capacity in the delivery of engines, tenders and cars, not only for the Pacific Coast extension, but also for the older divisions, where a large movement of traffic is now in progress.

From Superior, Wis., it is reported that the boiler and machine shops of the Great Northern Railroad will be largely remodeled during the next few months. A heavy traveling crane and new steel transfer table are among the proposed additions to the equipment, which calls for doubling the present force.

A machine shop for construction and repair work in connection with the properties of the Milwaukee Coke & Gas Company will be built this season.

The Bucyrus Company, South Milwaukee, has sold to the Atchison, Topeka & Santa Fe Railroad a second pile driver of the locomotive type, the first having been in successful operation for about eight months.

The Minnesota Steel Company has let a contract to the American Bridge Company for a two-decked steel bridge 300 ft. long, across the St. Louis River, just west of Superior, Wis., at a point to be designated as New Duluth.

The Fuller & Johnson Company, Madison, Wis., the extensions to whose plant were recently reported, has decided to increase by 25 per cent. the capacity of its gas engine department and to greatly enlarge the facilities for turning out agricultural machinery. For details of the new equipment required, address the company direct.

It is announced from Eau Claire, Wis., that the Phoenix Mfg. Company has had plans drawn for a large plant to be built next spring in which to manufacture saw mill machinery. The equipment details are now being worked out.

Plans approved by officials of the Chicago & Northwestern Railroad for the new ore dock at Escanaba call for a structure nearly $\frac{1}{2}$ mile long and 52 ft. wide, with high pockets and loading spouts. The machinery equipment will be of the most approved character, including apparatus as nearly automatic as can be secured.

A new smokestack will be built for the municipal power plant at Independence, Wis., and an additional boiler installed. Contract for the work has been let to the Winona Boiler Company.

The Janesville (Wis.) Electric Company has acquired a hydraulic power development at the foot of Lake Koshkonong, and will enlarge the plant by installing additional machinery.

In recent reports some indication has been given of the extent to which manufacturing facilities in Milwaukee have been extended within the past six or eight months; but there remains much to be told, and among noteworthy items of progress, as reported this week at a meeting of local commercial interests in which the writer participated, are the following:

The Prescott Steam Pump Company, West Allis, is putting in operation an addition, 50 x 200 ft., costing \$30,000. The building, which is to be used as a machine shop, is a solid brick structure, and will be equipped with traveling cranes in addition to the regular shop machinery. With this extension to its works, the company expects to employ an additional force of 40 men. It also reports having started a night force in the pattern and machine shops.

The International Harvester Company, which contemplates the erection of several new buildings costing nearly \$1,000,000, has already begun work on the new fireproof warehouse recently reported.

The Nortmann & Duffke Foundry Company, in Layton Park, is completing an addition, 86 x 160 ft. The building is of concrete and steel construction. This addition will be devoted entirely to the manufacture of pressed steel tanks, being equipped with a 300-hp. pressure plant, which will furnish power to four heavy pumps operating the hydraulic presses, the first two of which are already installed. This building, together with its equipment, will cost approximately \$65,000, and affords employment for a force of from 100 to 150 men.

The Heil Company is finishing an addition, 80 x 80 ft., one story, to its structural iron department. The building, which will be used as a machine shop, is of steel and brick construction, costing \$20,000, including the equipment.

The Allis-Chalmers Company is to make an extension to

the electrical and steam testing departments which will offer employment for a large additional force of men.

The Davis Mfg. Company, builder of automobile engines, which located at Fifteenth avenue and Park street about a year ago, is now doubling its floor space by an addition, 100 x 150 ft., to cost about \$12,000. This is much needed to take care of the rapidly increasing business, and it is expected to employ an additional force of at least 100 skilled mechanics.

Kearney & Trecker, West Allis, have just erected a new power house costing \$6000. The building, which is one story, 50 x 60 ft., is built of concrete, brick and steel. A new 150-hp. Corliss engine and 100-kw. generator have been installed.

W. R. Follmer will build a machine shop at the corner of Ferry and Lake streets, to cost approximately \$11,000. It is expected that \$20,000 will be spent on machinery.

Due to increase in business, the Milwaukee Aluminum Company, now located at 163 Barclay street, is erecting a modern aluminum and brass foundry at Reed and South Pierce streets. The building, 30 x 140 ft., is a one-story brick structure, and will cost, together with equipment, about \$13,000.

The Nordberg Mfg. Company, which recently built a large addition to its foundry, thereby making it one of the largest Corliss engine foundries in the country, states that it is now in position to offer employment to an increased force of 200 to 300 men. Officials state, however, that they are having some trouble in securing the right kind of skilled labor.

In summing up the developments of the last 60 days, the association above referred to finds that considerably over \$1,000,000 will have been spent and room made for approximately 1000 additional workmen.

New England Machinery Market.

BOSTON, MASS., October 12, 1909.

The machinery market is featureless, in that it is not punctuated by orders out of the usual in numbers of machines or totals in dollars. But there is an improvement, so slight at times as not to be noticeable from day to day, but revealing itself in totals of weeks and months. The dealers are apparently satisfied with conditions as they exist. It has been the invariable experience during other similar periods, when general manufacturing is improving rapidly following a depression, that the machine tool trade was one of the last to return to a good, normal basis. The automobile trade has relieved this condition to a certain extent this year, but in New England, where the production of automobiles is limited, the dealers have received most of their benefits from the manufacturers of parts and accessories, and these are not as a rule large buyers. At the present time the improvement from general sources is constant and healthful, though small, with many signs that buying will soon be more evenly distributed among the various classes of customers. It would take no great change in this respect to put the market on a very profitable basis.

The paper mills have done less buying than usual this year, as little new construction of new plants has been done during the past 12 months. In some seasons this industry has been a somewhat important customer. The textile mills, however, are more conspicuous in the market than ever. It looks as if the lessons taught in some of the modern mills that a really good repair shop is a paying investment is spreading in its application.

The machine tool builders report a continued prosperous condition, but orders are still confined to the automobile trade in a larger percentage than will be the case before a great while has elapsed.

The Osgood, Bradley & Sons Company, Worcester, Mass., car builder, has purchased a tract of land at Greendale, in the northern section of the city, and will erect a large plant on the site. Construction will begin as soon as the land is cleared and graded. The erecting shop will be 440 ft. long and 280 ft. wide, with central section 100 ft. wide and 57 ft. high, served by 50-ton traveling crane, and with a bay at each side 90 ft. wide, served by a 10-ton crane. The paintshop will be 149 x 280 ft., including a bay 60 ft. wide. The power house will be 60 x 140 ft. and 39 ft. high. These buildings will be of steel and concrete construction. In addition there will be a lumber kiln 50 x 100 ft., a lumber shed 50 x 200 ft., and a two-story office building 40 x 80 ft., these structures to be of wood. A considerable amount of new machine equipment will be required later, but no list has been prepared. The crane contracts have been placed. Negotiations are in progress with a view to purchasing power from the Connecticut River Power Company, which, if successful, will mean confining the power equipment to boilers for heating. The company will provide room in its power house for the installation of steam engines and electric generators, if they be required later. The scope of the product will be enlarged. In the old shops wooden railroad coaches

constituted the standard line. The future products will be steel framed as well as wooden coaches, and trolley cars. The Bradley business is an old one. The site at Washington square was spoiled by the taking of a large section by the railroad companies in connection with the abolishing of grade crossings and the building of a new union station. Production is still going on there, however, on a reduced scale. The company has large contracts from the New York, New Haven & Hartford Railroad, and other work will be possible when the larger plant is ready for occupancy. As there are more than 50 acres in the site ample room for growth is available. The land forms a continuation of the Barbers Crossing section, with its group of important and growing industries, including the Norton Company, Norton Grinding Company, Morgan Spring Company and Worcester Pressed Steel Company. A new corporation is organizing to conduct the business, which is one of the few that did not enter into the combination of car builders which was effected some two years ago. John E. Bradley will remain at the head of the management.

The Pratt & Whitney Company, Hartford, Conn., has announced plans for increasing its capital stock by which \$1,250,000 will be added to outstanding securities. The present issue of \$1,225,000 of preferred stock will be retired, its terms calling for its redemption at par, January 1, 1911. New 6 per cent. preferred stock to the amount of \$2,000,000 will be issued, redeemable January 1, 1921, and guaranteed by the Niles-Bement-Pond Company, the controlling corporation. The common stock will be increased from \$1,525,000 to \$2,000,000, all the new shares to be taken by the Niles-Bement-Pond Company. Present stockholders are given the privilege of subscribing to the new preferred stock. By this plan the Pratt & Whitney Company's treasury will receive \$775,000 from the preferred stock and \$475,000 from the common. The statement includes the fact that the cost of the Hartford plant to January 1, 1908, was \$3,586,067, and the assets on December 31, 1908, were \$5,802,365. Very large additions have been made during the last two years and others are planned, those for the immediate future including a new pattern storage building. The Pratt & Whitney works are rushed with business, the automobile industry being the chief factor in the buying. Some departments are running evenings until 9 o'clock. Difficulty in securing good labor continues as an obstacle to increasing working forces to the maximum capacity of the plant.

The Boston store of the Fairbanks Company, at Franklin and Pearl streets, has installed a power plant in its basement, consisting of a 25-hp. Fairbanks' gas engine, using illuminating gas from the city mains, and a General Electric generator, direct connected. The unit provides light for the establishment and operates the repair shop and elevators.

The Blake & Johnson Company, Waterbury, Conn., is occupying its new plant at Waterville, a suburb of the city. The transfer of machinery from the East Main street factory has been completed, and the offices have been moved to Waterville. The North Elm street shops of the company are not affected by the change.

The E. J. Manville Machine Company, Waterbury, Conn., manufacturer of thread rolling machines, cold headers, power presses and automatic machinery, is erecting a one-story building, 46 x 80 ft., for its pattern department and pattern storage. The extension of the plant was necessary because the machine shop requires all the available space in the main building.

The New Haven Clock Company, New Haven, Conn., is adding a story to the building containing its automatic machinery. The work is being done while the building is in use, as the rush of business precludes the possibility of shutting down any of the departments. The new five-story building is now occupied.

J. W. Rockwell, Hartford, Conn., manufacturer of packing boxes, is erecting a new factory at Mechanic and Grove streets. He will occupy a part of the building and will rent one floor for manufacturing. Mr. Rockwell states that he has contracted for most of the new machinery.

The Secor Typewriter Company, Derby, Conn., has been incorporated with an authorized capital stock of \$30,000, to commence business with \$20,000. The incorporators are Daniel S. Brinswade, Shelton, Conn.; Frederick A. Richardson, Burlington, Vt., and Charles N. Downs, Derby. The company is not yet ready to give out details of its plans, but it is understood that it will manufacture typewriters, presumably at Derby.

The Manufacturers' Foundry Company, Waterbury, Conn., manufacturer of gray iron castings, will build a one-story concrete addition, 50 x 103 ft., to be used as a core room. No equipment will be required, the company states.

The works of the Jones & Lamson Machine Company, Springfield, Vt., are very busy. The large machine shop building which was built just previous to the slump is now in as full operation as possible under present conditions, giving very greatly increased manufacturing capacity. Conditions with the company approximate those of three years ago.

The Fellows Gear Shaper Company, Springfield, Vt., is very busy. The new building, allusion to which was made

last week, is nearly ready for occupancy, and machinery which will form part of its equipment is already in operation. The building is 50 x 200 ft., one story.

The Fremont Association, Worcester, Mass., will erect a new factory building on Fremont street, to cost \$50,000. It will be rented for general manufacturing purposes.

John T. Brierly has purchased the interest of W. H. Crawford in the mill supply house of W. H. Crawford & Co., Worcester, Mass. The business is an old one, having been established by Sumner Pratt in 1847. Mr. Brierly has been connected with the house for 23 years.

The C. H. Cowdry Machine Company, Fitchburg, Mass., builder of special machinery, is erecting an addition 40 x 50 ft. and three stories. The company is now operating on a 15-hour a day basis.

The Ready Tool Company, New Haven, Conn., has increased its capital stock from \$10,000 to \$25,000, the purpose being to secure a larger working capital.

The New Haven Hospital, New Haven, Conn., is planning to establish a new power and refrigerating plant, to cost \$25,000. No engineer has been selected for the work.

The Stewart & Skinner Company, Worcester, Mass., has been organized to manufacture hardware specialties. Charles A. Stewart and J. T. Skinner are the owners. The chief product will be the Stewart automatic sewing awl. The company will not do its own manufacturing for the present.

Late announcements of improvements in general manufacturing plants include the following: Winsted Hosiery Company, Winsted, Conn., four-story addition, 32 x 90 ft.; Tiffany & Pickett, Winsted, Conn., lumber mill, 60 x 120 ft., one story; L. C. Chase & Co., 89 Franklin street, Boston, textile mill, to cost \$10,000; Weidlich Brothers Mfg. Company, Bridgeport, Conn., two-story mill, 140 ft. long.

Other enlargements and new works announced include the following: The Viscoloid Company, Leominster, Mass., machine shop, 40 x 320 ft., two stories; manufacturing building, 45 x 60 ft., two stories; manufacturing building, 30 x 60 ft., one story, and storage building; D. Goff & Son, Pawtucket, R. I., textiles, one-story addition for finishing department; J. D. Clark Company, Greenville, Mass., dye house and boiler house; Merchants' Mfg. Company, Fall River, Mass., extension of main building to increase production 12 per cent.; W. H. McElwain Shoe Company, Newport, N. H., addition to increase capacity 20 per cent.; United States Dress Goods Company, Olneyville, R. I., new mill in which 4000 spindles will be installed.

Philadelphia Machinery Market.

PHILADELPHIA, PA., October 12, 1909.

The general tone of the market is somewhat more favorable. The number of machinery builders and iron and steel working and industrial plants which are approaching more normal conditions is larger. Not all have yet attained a full working capacity, but the percentage at which plants are operating is gradually and steadily increasing. In some few cases where specialties are manufactured there has been a rush of orders, which during the last month have been larger than any month since the depression set in in 1907. Machine tool builders note particularly the lack of any material volume of business originating in this territory; by far the greater proportion of the current orders coming from outside districts, New England and the Middle West being the most active buyers. The larger industrial concerns are gradually coming into the market as their equipment becomes better employed and requirements in various departments become greater. Delayed deliveries, more particularly on tools manufactured in the Middle West, are interfering with sales to some extent, deliveries on certain sizes being fully six months distant. Some builders of special equipment note a slight diminution in orders, but inquiries are reported of good volume. Prices in general are very firm, and in some directions advances are anticipated, particularly as the cost of raw material is increasing. The foreign demand for tools of the usual standard types continues to drag. For special equipment there has been a somewhat scattered demand, and orders have been booked for a few tools for export. In the various power transmission specialties business has been of a somewhat irregular character; in some lines a slight betterment is noted, while in others it has been about on an even basis.

The demand for second-hand machine tools has been a shade more active. The demand for second-hand engines is still unsatisfactory, although for boilers, particularly of the medium capacities, it is a trifle more active. The majority of the heavy engine builders are becoming better engaged. Inquiries are good, and considerable business is under negotiation, but propositions of the larger size close up slowly.

A fair run of foundry business continues to develop, but no particularly heavy orders are reported. Founders are

considering the advancement of prices, but so far no general increase is noted. Steel casting plants continue to book a fair volume of business and are now pretty well engaged. Jobbing foundries are fairly active, while those making a specialty of textile machinery castings are quite busy.

The John B. Stetson Company, hat manufacturer, Fourth street and Montgomery avenue, is understood to be having plans prepared by its own engineers for an eight-story factory building, 150 x 207 ft., to be added to its present group of buildings.

It is reported that the Council of Irvington, N. J., has adopted a resolution authorizing the lighting commission to have plans prepared for a municipal lighting plant. George Wells is chairman of the commission.

The Pennsylvania Shafting Company, Spring City, Pa., is now running its plant the longest hours it has ever been operated. August and September were record months, exceeding the tonnage taken during the busy periods of 1906 and 1907. Normal business conditions have returned as far as this company is concerned, and it is believed that the present activity will continue.

The Eynon-Evans Mfg. Company is running all departments of its plant at full capacity. This concern has been comfortably busy during the greater part of the recent depression, but notes a sharp improvement in business the past few months. Its pattern shop is fully engaged on a quantity of large work; the foundry is busy on a general line of bronze and brass castings, while the machine shop has a large amount of general business under way. A good volume of business in steam jet blowers is reported, deliveries being extensively made to steel works and industrial plants.

The Stoeve Foundry Mfg. Company, Myerstown, Pa., received orders the past month for more pipe threading and cutting-off machines than were taken during the entire first six months of the year. Business is better in all lines than at any period in the past two years. Working forces have been increased, and the plant is being operated day and night. The prospects are that this company will break its previous record for sale of pipe machines the present year.

The Thomas H. Dallet Company, while comfortably busy for the past year, notes a decided increase in business the past 60 days, and is now operating its plant on full time with full force. Orders have been quite satisfactory for both pneumatic tools and air compressors, and from present appearances a full period of activity is expected the coming winter.

The Bateman Mfg. Company, manufacturer of agricultural implements, Grenloch, N. J., is about completing its new four-story reinforced concrete building, giving about an acre of additional floor space, and expects to occupy it about the middle of December. A large portion of the new building will be used for paint and assembling departments. In addition to this about 6000 sq. ft. have been added to the machine shop, and the foundry has been enlarged so as to permit of the installation of a brass melting furnace. This concern has recently contracted for the installation of an equipment of 160 hp., purchasing a Riverside engine and an R. D. Wood & Co. suction gas producer. The generator, which will be directly connected with the gas engine, is of the Crocker-Wheeler make. In addition to the equipment recently mentioned in these columns, the Bateman Company will shortly be in the market for motors. The shear, forge, machine, foundry and woodworking departments of the company's plant are being operated at full capacity, with every indication that the volume of business next season will be the largest the concern has known.

An evidence of the return to better business conditions in Pennsylvania is manifest in the recent activity in the formation of trolley companies and construction of extensions, no less than five electric railway companies having been chartered in the five days between October 4 and 9. Not many more such companies have been incorporated in as many months in the last two years. The five new companies represent a capitalization of about \$6000 a mile and the mileage aggregates 84. Two of the roads are to be built in the iron and steel districts. In addition notice of the intention to construct almost 100 miles of new trolley road has been given by various companies since October 1, four-fifths of the proposed new construction to be in the coke making counties of Westmoreland and Fayette.

San Francisco Notes.

The Victor Rail-Joint Company has been incorporated in San Francisco, with a capital stock of \$50,000, by E. C. Harris, L. M. Verso, S. M. Ginsberg, J. S. McNaney and J. A. Axman.

The Radical Power Hammer Company has been incorporated in Los Angeles, Cal., with a capital stock of \$25,000, by J. A. Brown, F. E. Sutherland, M. H. Bridle, A. H. Lidders and H. E. Brett.

The Arrowhead Portland Cement Company has awarded to Smith, Emery & Co., San Francisco, a contract for

installing a cement mill with a capacity of 1000 barrels per day at Etiwanda, Cal., at a cost of about \$700,000.

The Washington Pipe & Foundry Company is adding a new building to its plant at Tacoma, Wash., and will double its capacity.

W. E. Hampton, well known locally as a machinery salesman and engineer, has purchased the Standard Iron Works in San Francisco.

The manufacture of gasoline engines is becoming an important item on the Pacific Coast. Several of the local manufacturers have recently booked large orders for export, making shipments to New Zealand and Australia, as well as the Hawaiian Islands.

Machine and pattern-making shops and a foundry are to be installed at the Berkeley, Cal., high school.

The Compressed Air Machinery Company of this city is about to occupy a new brick building at Ecker and Stevenson streets.

The San Francisco Fire Commissioners have awarded a contract for a number of fire engine boilers to the Dundon Iron Works of this city.

The Crescent Iron Works has been incorporated at Coalinga, Cal., with a capital stock of \$25,000, by F. W. Thompson, D. M. Speed and N. A. Johnson.

The Ballin Water Tube Boiler Company has been incorporated at Portland, Ore., with a capital stock of \$50,000, by F. A. Ballin, A. Languth and E. G. Gordon.

The partnership heretofore existing between W. D. Halket and Thomas Mark, under the name of the Bay City Iron Works, has been dissolved, and the business will be continued under the same name by W. D. Halket, with headquarters at 1243-1245 Harrison street, San Francisco.

Harron, Rickard & McCone, machinery dealers, removed September 1 from their offices in the Sheldon Building to their new warehouse at 139-149 Townsend street, San Francisco, where a large stock will be carried.

The Crane Company's new building at Second and Brannan streets, San Francisco, is about completed, but the company will continue to occupy its temporary quarters at First and Howard streets until about December 1.

Five of the 11 buildings of the new plant of the Vulcan Iron Works at Seattle, Wash., are under construction, and contracts for the others will soon be let.

The Combined Bolt & Nut Lock Company has been incorporated in San Francisco, with a capital stock of \$200,000, by Edw. McGrath, F. M. and A. W. Meiggs, A. H. Stephens and R. G. Hudson.

The Santa Paula Tool Company has been organized at Santa Paula, Cal., by C. C. Teague, A. C. Hardison, F. E. Davies and others, and has taken over the shops formerly conducted by the Union Oil Company and the California Tool Company.

The Pacific Metal Works is preparing to erect a warehouse and foundry on land recently acquired in Portland, Ore.

The Willamette Iron & Steel Works, Portland, Ore., has taken a contract for a steel tug for Columbia River service, for \$92,350.

Government Purchases.

WASHINGTON, D. C., October 12, 1909.

Bids will be received until October 27 at the office of the Constructing Quartermaster, Fort Stevens, Ore., for an additional pump for the pumping plant.

The following bids were opened October 5 for machinery for the navy yards:

Class 1, Bid A.—One 40-ton and one 10-ton traveling crane, to be erected by the Government on contractors' specifications—Bidder 10, Alliance Machine Company, Alliance, Ohio, \$10,487; 40, Cleveland Crane & Engineering Company, Wickliffe, Ohio, \$9630; 44, Case Crane Company, Columbus, Ohio, \$8490; 83, Henshaw, Bulkley & Co., San Francisco, Cal., \$10,487; 114, Morgan Engineering Company, Alliance, Ohio, \$11,410; 115, Modern Steel Structural Company, Waukesha, Wis., \$11,449; 123, Manning, Maxwell & Moore, New York, \$9183; 129, Northern Engineering Works, Detroit, Mich., \$9320; 131, Niles-Bement-Pond Company, New York, \$7965; 197, Whitling Foundry Equipment Company, Harvey, Ill., \$9030 and \$8450.

Class 1, Bid B.—Furnishing and installing one 40-ton and one 10-ton traveling crane—Bidder 114, Morgan Engineering Company, Alliance, Ohio, \$12,000; 115, Modern Steel Structural Company, Waukesha, Wis., \$12,034; 131, Niles-Bement-Pond Company, New York, \$9090.

Class 1, Bid C.—Furnishing and erecting complete one 40-ton and one 10-ton crane runway—Bidder 1, American Construction Company, San Francisco, Cal., \$14,800; 48, Dyer Brothers, San Francisco, Cal., \$18,141; 71, G. & W. Mfg. Company, New York, \$34,990; 114, Morgan Engineering Company, Alliance, Ohio, \$26,350; 115, Modern Steel Structural Company, Waukesha, Wis., \$25,898.90; 131, Niles-Bement-Pond Company, New York, \$17,445.

Class 1, Bid D.—Furnishing and erecting complete extension to 40-ton runway—Bidder 1, American Construction Company, San Francisco, Cal., \$8900; 48, Dyer Brothers, San Francisco, Cal., \$6885; 71, G. & W. Mfg. Company, New York, \$8300; 114, Morgan Engineering Company, Alliance, Ohio, \$9995; 115, Modern Steel Structural Company, Waukesha, Wis., \$8484; 131, Niles-Bement-Pond Company, New York, \$8750.

Class 1, Bid E.—Furnishing and erecting complete one 40-ton and one 10-ton traveling crane runway and extension to 40-ton runway—Bidder 1, American Construction Company, San Francisco, Cal., \$23,700; 29, W. N. Concannon Company, San Francisco, Cal., \$28,662; 48, Dyer Brothers, San Francisco,

Cal., \$25,026; 71, G. & W. Mfg. Company, New York, \$43,290; 114, Morgan Engineering Company, Alliance, Ohio, \$35,945; 115, Modern Steel Structural Company, Waukesha, Wis., \$34,383.90; 131, Niles-Bement-Pond Company, New York, \$26,195; 145, Penn Bridge Company, Washington, D. C., \$25,402.

Class 1, Bid F.—Furnishing and installing one 40-ton and one 10-ton traveling crane, furnishing and erecting 40-ton and 10-ton crane runways and furnishing and erecting extension to 40-ton crane runway—Bidder 29, W. N. Concannon Company, San Francisco, Cal., \$39,734; 114, Morgan Engineering Company, Alliance, Ohio, \$47,650; 115, Modern Steel Structural Company, Waukesha, Wis., \$46,617.90; 131, Niles-Bement-Pond Company, New York, \$35,285.

Class 11.—One horizontal dense air ice machine, with spare parts—Bidder 151, H. B. Roelker, New York, \$8826; 154, Reynolds Ice Machine Company, New York, \$8100.

Class 91.—Two motor driven centrifugal pumps—Bidder 11, Alberger Condenser Company, New York, \$1115; 24, Blackhall & Baldwin Company, New York, \$1435.50; 46, Dravo Doyle Company, Philadelphia, Pa., \$2020 and \$2475.50; 52, D'Oiler Engineering Company, Philadelphia, Pa., \$1710; 92, Jeanesville Iron Works, Hazleton, Pa., \$1588.50 and \$1488.50; 123, Manning, Maxwell & Moore, New York, \$1737 and \$1622.50; 134, National Electrical Supply Company, Washington, D. C., \$1692; 141, J. Edward Ogden Company, New York, \$1464.83; 192, Watson-Stillman Company, New York, \$1532; 194, Henry R. Worthington, New York, \$1791.50 and \$1929.

Class 92.—One complete equipment for oxygen and acetylene generating and compressing machines—Bidder 53, Davis-Bourbonville & Co., New York, \$9565.72; Nelson Goodyear, New York, \$4257.80.

Class 101.—Four geared head motor driven engine lathes, with spare parts—Bidder 62, Fairbanks Company, New York, \$5136 and \$4608; 131, Niles-Bement-Pond Company, New York, \$5200.

Class 102.—Eight geared head motor driven engine lathes, with spare parts—Bidder 62, Fairbanks Company, New York, \$13,836 and \$12,996; 131, Niles-Bement-Pond Company, New York, \$12,752 and \$13,840; 209, Chandler & Farquhar Company, Boston, Mass., \$11,160 and \$12,760.

Class 103.—One complete outfit of tanks, pumps and piping for an oil storage and distributing system—Bidder 14, S. F. Bowser Company, Ft. Wayne, Ind., \$3665; 42, E. J. Codd Company, Baltimore, Md., \$3140; 130, New Jersey Foundry & Machine Company, New York, \$4763; 134, National Electrical Supply Company, Washington, D. C., \$3780.

Class 104.—Three belt driven shapers—Bidder 123, Manning, Maxwell & Moore, New York, \$625 and \$442; 131, Niles-Bement-Pond Company, New York, \$600; 147, Prentiss Tool & Supply Company, New York, \$712.80 and \$637.81; 149, Queen City Machine Tool Company, Cincinnati, Ohio, \$633.

Class 105.—Two No. 2 vertical spindle milling machines—Bidder 18, Brown & Sharpe Mfg. Company, Providence, R. I., \$1124.20; 68, Garvin Machine Company, New York, \$550.

Class 106.—Four No. 0 plain milling machines—Bidder 18, Brown & Sharpe Mfg. Company, Providence, R. I., \$344.15; 20, Becker Milling Machine Company, Hyde Park, Mass., \$325; 68, Garvin Machine Company, New York, \$363; 120, Motley, Green & Co., New York, \$375; 123, Manning, Maxwell & Moore, New York, \$350; 131, Niles-Bement-Pond Company, New York, \$380; 147, Prentiss Tool & Supply Company, New York, \$335; 209, Chandler & Farquhar Company, Boston, Mass., \$360.

Class 111.—Eight marine water tube boilers, and spare parts—Bidder 12, Babcock & Wilcox Company, New York, \$13,750; 216, Mosher Water Tube Boiler Company, New York, \$9741.20.

Class 112.—Eight marine water tube boilers, and spare parts—Bidder 12, Babcock & Wilcox Company, New York, \$13,750; 216, Mosher Water Tube Boiler Company, New York, \$9741.20.

Bids were received September 30 by the Isthmian Canal Commission, Washington, for furnishing one duplex horizontal plunger pump as follows:

Buffalo Steam Pump Company, Buffalo, N. Y., \$150; Elliott Machine Company, Baltimore, Md., \$270; Fairbanks, Morse & Co., New York City, \$208; Knox & Bro., New York, \$210, \$218 and \$226; National Electrical Supply Company, Washington, D. C., \$131.77.

It has been computed that at the high prices recently reached by the securities of the United States Steel Corporation they had a quoted value of nearly \$100,000,000 above par. The reckoning includes \$399,797,000 of first mortgage and subsidiary company bonds at par; \$198,469,500 second mortgage 5s at 106, or \$205,077,670; \$360,281,100 preferred stock at 131, or \$471,968,241; \$508,302,500 common stock at 94%, or \$482,451,996—a total quoted value of \$1,559,294,907 for securities of a face value of \$1,461,850,100.

The Deforest Sheet & Tin Plate Company, Niles, Ohio, states through its president, W. A. Taylor, that its plant will be operated on the open shop basis. The company has leased all the vacant houses in Niles for the use of its workmen, who will come there from other localities.

Coatesville, Pa., is making preparations for celebrating next year the one hundredth anniversary of the rolling of the first boiler plate in America. This was done in that place in 1810 in a small mill operated by water power, which was the beginning of the great plant of the Lukens Iron & Steel Company.

The Union Sheet & Tin Plate Company, operating sheet and tin mills at Marietta, Ohio, and Hazleton, Pa., has opened offices in the Farmers' Bank Building, Pittsburgh.

HARDWARE

HARDWARE merchants are constantly receiving information about approved methods of conducting business, means by which trade may be extended and profits enlarged. They are thus put in possession of advice, both stimulating and practical, which should be

Making Use of Trade Winning Methods

helpful to them. This contact with new and admirable methods is given to some extent in the annual meetings of the associations, but to a much larger extent through the columns of the trade papers. The great problem is the application of such information to one's business. The wise merchant must act upon suggestions which come up to him. This will sometimes be by pronouncing against them if they do not fit his case. If, however, they have merit, they should be made use of and not simply complimented and then permitted to pass out of mind. Occasionally they may be adopted just as given. Usually, however, they require modification to adapt them to the individual methods of the merchant, and the circumstances in which he is placed. The ability to do this is one of the marks of a good merchant and calls for judgment and decision. It is one form of the great quality of initiative—taking the thought or plan of another and improving upon it. The trouble in a multitude of cases, we might almost say in 99 cases out of 100, is that in spite of the recognition of the excellence of the suggestion and the approval of the new methods, things continue to go along in the old well worn rut.

As we go to press the most important conclave of the Hardware trade is in session at the great convention city by the sea. There is the coming together of the representatives of the two great divisions of the trade, the manufacturers and the jobbers, who hold their

Atlantic City Conventions

separate conventions, with a couple of joint meetings to manifest and cultivate the spirit of fraternity, and to discuss the important questions in which they have mutual, or, possibly, conflicting interests. The retail merchants might, if it were deemed wise to arrange it, have their own convention at the same time and place. If this were done it would be a most interesting and impressive gathering of the clans, and there is no doubt the retail distributors, if present in large numbers with representative merchants, would receive a hearty welcome, and not a little attention, from the two larger bodies from whom they purchase their goods. As it is the organized retail Hardware merchants will be most efficiently represented by official representatives of the National Retail Hardware Association. Beside addressing the convention at one of the opening sessions, there will be little opportunity for them to participate in the discussions concerning trade questions, many of which relate directly and in a most important way to their interests.

It would be well if it were possible for the retail merchants to have a voice in the settlement of questions which are now determined by the jobbers and manufacturers in view of their own interests, naturally giving only secondary consideration to the interests of the tens

The Interests of Retail Merchants

of thousands of retail distributors throughout the country. This is, indeed, in accordance with the operation of the laws of trade. Each association is organized to look

after the interests of its own members. If it is wise it will, of course, bear in mind the other departments of the trade, for otherwise their action would be sure to encounter obstacles and opposition. Its main purpose, however, is to take care of itself. While the retail merchants are not represented in convention at Atlantic City, they can, as has been shown, very effectively stand up for themselves and their rights in their separate gatherings, and thus have voice, sometimes, indeed, in the way of protest, in regard to questions that have direct bearing upon their welfare.

Condition of Trade.

Reports from the different sections of the country are in general very satisfactory. They indicate a growing confidence in the outlook based on prosperous conditions among the people at large and a return of confidence on the part of capital. With this there is a quickening in the movement of trade. Business in leading branches is at least fairly active, and in some it is decidedly active and attains a large volume. There is money to spend, and a greater readiness than there has been for some time to put it into circulation for articles purchased for consumption and to employ it in trade channels that it may further increase. These influences combined are working together to make the prospect for the next few months promising and to lead to the expectation entertained by many that next year will bring a large volume of business. The tone of the iron market naturally adds strength to Hardware and all iron products and expressions of wonder are made at the rapid recovery which has taken place from the depressed conditions which prevailed only a short time ago.

There is no doubt that the past week has witnessed an increase in the volume of trade in Hardware circles. Reports from retail merchants, while not as enthusiastic in regard to the immediate situation as are some of the jobbers, indicate generally a fair activity and hopeful feeling, but at the same time give the impression that the lessons of the past two years are not forgotten, and that there remains some of the conservatism and hesitancy which belong to the period following times of stress and difficulty. There is a good deal of difference in the reports that come from the various sections. The West continues to be more hopeful and more fully occupied than the East, a fact which is easily explained by the predominance there of agricultural interests and the prosperity of the farmers, especially the farmers of the West, is one of the notable and gratifying features of the situation. The high prices which prevail for articles of food while they add to the cost of living, and consequently to the cost of manufacturing, contribute directly to the welfare of those who cultivate the soil. Their well being fortunately in due course puts money into circulation, keeps the mills and factories busy, and gives employment to labor.

The great event of the present week is the meeting of the National Hardware Association and the American Hardware Manufacturers' Association in simultaneous conventions at Atlantic City. An opportunity will thus be given for the meeting of old friends and the cultivation of the amenities of the trade, as well as for the graver consideration of such vexed questions as special

brands and other matters in which there is a conflict of interests. The growing disposition to recognize the rights of the other departments of trade is a gratifying characteristic of the times, and mitigates to some extent the necessary stress of competition, which in extreme, though not unusual, forms too often has brought needless friction into the transaction of business, which might be conducted in a broad, considerate and even kindly spirit.

Chicago.

If events of the past week have developed little of specific interest in the Hardware market, there is comforting assurance in the fact that conditions are in no wise less promising of continued advancement, and that trade in general is expanding. Perhaps the movement is not as rapid in some directions as might be expected or desired, but such backwardness as is noted cannot be traced to any permanent cause fundamentally opposed to progress. Consumptive buying of fall requirements by the farming interests has been somewhat slow in developing, but in the West and Northwest the work of seeding and disposition of harvested crops is still occupying attention, which will later be turned to fencing and other improvements that will call for products of the factory. New orders for Wire Nails and Barbed Wire, especially from the smaller dealers, are gradually becoming more plentiful. As a rule, the retail trade did not lay in stocks of these goods at the low prices available in the spring sufficient to carry them through the year, as did some of the large buyers. It is, therefore, anticipated that before the season is much further advanced a decided improvement in the demand for such Wire products will be realized. Attention has heretofore been called to the fact that more or less difficulty was being experienced in securing prompt mill and factory shipments, particularly in the heavier lines of Iron and Steel materials. This is still true of Black and Galvanized Sheets, and delay is even extending to products made therefrom. A case in point is that of Stove Boards, which are just now in seasonable demand, but in many instances are not being forwarded with satisfactory promptness. Notice of slight advances in Galvanized Tubs and Pails is being sent out by some manufacturers, and similar action will likely follow in other lines directly affected by higher costs of raw material. Few mills are able to promise shipment of Black Stove Pipe Sheets in time to supply requirements for the current season, leaving jobbers' stocks as the only available source of supply for immediate wants.

NOTES ON PRICES.

Wire Nails.—There has been an increase in demand so that mills are fairly filled with new orders and are also making shipments on business placed in May, which has not all been cleaned up. Contracts are accepted for shipments within 60 days, which is regarded by some as signifying a possible advance in prices in view of the scarcity and higher prices of steel used in the manufacture of nails. The market is referred to as being steady at regular prices. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers.....	\$1.80
Carload lots to retail merchants.....	1.85
Less than carloads to jobbers.....	1.85
Less than carloads to retail merchants.....	1.95

New York.—Business, which was small during the Hudson-Fulton celebration, has not recovered its vigor to the extent that the trade desires. Owing to low cost Nails and light demand the market has developed some unevenness, although the general quotation continues to be based on \$2 per keg, for small lots at store.

Chicago.—New buying, though somewhat tardy in developing, is becoming more active and has shown a marked increase in the past week. The large amount of business taken by the mills at the \$1.70 price is strikingly demonstrated by the fact that shipments of specifications against such contracts are still going for-

ward, but are rapidly being diminished and will doubtless soon be completed. When they are all out of the way it is expected that new demand will grow heavier and the prospects for a good fall trade are bright. The market holds firm and prices are reported as being steadily maintained at the following quotations: \$1.98, Chicago, in carloads to jobbers, and \$2.03 in carloads to retailers, with an advance of 10 cents for less than carloads from mills.

Pittsburgh.—The large jobbing trade has not yet worked off its stocks of Wire Nails bought at the \$1.60 and \$1.70 price, but these are being depleted at a fairly rapid rate and will soon be exhausted. As soon as this is done, new demand for Wire Nails is expected to materially improve. It is referred to at present as being fairly heavy, and shipments of Wire Nails by the mills are up to full capacity, as are also operations. The leading Wire Nail makers are willing to enter orders for Wire Nails for shipment within 60 days from date at the \$1.80 base price, but will not accept contracts for delivery beyond that period, believing that in a month or two an advance may be made. This view is strengthened by the higher cost of Steel and Wire Rods, both of which are scarce and commanding premiums for prompt delivery. The market is very firm, and we quote Wire Nails at \$1.80 base f.o.b., Pittsburgh, in carload and larger lots.

Cut Nails.—The difficulty in obtaining Nail Slabs promptly and the advance in prices for same, together with the increase in demand, has had a steadying effect on the Nail market. Withdrawals on orders previously placed with mills are in satisfactory volume. Quotations are on the basis of \$1.80 to \$1.85 per keg in carload and larger lots, f.o.b. mill, with \$1.80 regarded as the minimum price with the majority of manufacturers.

New York.—The local demand is comparatively light, following the trend of Wire Nails. Small lots at store are generally held at \$2 per keg, base.

Chicago.—Increasing demand and higher costs of raw material have had a satisfactory effect on prices, which are no longer subject to the weakness and irregularity that until recently was characteristic of the Cut Nail market. Both as to new buying and specifications the movement is more active and jobbers are finding it necessary to order more liberally for the replenishment of stocks. We quote in car lots to jobbers, Steel Cut Nails, \$1.98; Iron Cut Nails, \$2.08.

Pittsburgh.—New demand is fairly heavy, and specifications against contracts are coming in at a satisfactory rate to the mills. The scarcity in supply of Nail Slabs, and the higher prices ruling, are reflected in Cut Nail prices, which are firmer than for some time. We quote Cut Nails at \$1.80 to \$1.85, base, f.o.b. Pittsburgh, in carload and larger lots, and it is stated the lower price is minimum of the market.

Barb Wire.—A moderate increase in the volume of new business being received by the mills indicates that earlier orders are being shipped, and promises larger demand when these are entirely out of the way. There is a feeling in some quarters that the scarcity and higher prices of steel may result in an advance in the finished product. Prices are referred to as being maintained. Quotations are as follows, f.o.b. Pittsburgh.

	Painted.	Gal.
Jobbers, carload lots.....	\$1.80	\$2.10
Retailers, carload lots.....	1.85	2.15
Retailers, less than carload lots.....	1.95	2.25

Chicago.—Substantial improvement is noted in new demand, a fact that is regarded as a forecast of a more lively market as soon as all uncompleted contracts are out of the way. But little such business remains to be disposed of and at the present rate of shipment the last remnants of the heavy tonnage taken at the former low prices will soon disappear. We are advised that prices are firmly maintained at the current level, which we quote as follows: To jobbers, Chicago, carloads, Painted, \$1.98; Galvanized, \$2.28. To retailers, carloads, Painted, \$2.08; Galvanized, \$2.38; retailers, less than carloads, Painted, \$2.18; Galvanized, \$2.48. Staples, Bright, in

carloads, \$1.98; Galvanized, \$2.28; carloads, to retailers, 5 cents extra, with an additional 10 cents for less than carloads.

Pittsburgh.—Makers of Barb Wire are still principally engaged in filling specifications against contracts taken some time ago, when prices were lower than they are now, but we note that new demand is fair and promises to materially increase as soon as present contracts on the books of the mills have been filled and shipped out. In view of the growing scarcity in supply of Steel and the higher prices ruling an advance in prices of Wire products is looked for before long. The market is strong, and we quote Galvanized Barb Wire at \$2.10 and Painted at \$1.80 in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Fence Wire.—Shipments from mill on former orders are heavy in response to urgent requests from purchasers for more prompt deliveries. Mills are said to be accepting contract orders for delivery covering the next three and six months. The market is very even in the matter of price, quotations to jobbers in carload lots being as follows, on a basis of \$1.60 for Plain and \$1.90 for Galvanized, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days, the usual price to retailers being 5 cents additional:

Nos.	0 to 9	10	11	12	12½	13	14	15	16
Annealed	\$1.60	1.65	1.70	1.75	1.85	1.95	2.05	2.15	
Galvanized	1.90	1.95	2.00	2.05	2.15	2.25	2.65	2.75	

Chicago.—Manufacturers of Wire Fencing are crowding the mills for shipment of specifications against contracts and such factories are extremely busy. Contracts covering a fair tonnage for delivery through the first quarter and half of next year are being placed. Prices are firm and we quote as follows: Carloads, to jobbers, \$1.78, base, f.o.b. Chicago.

Pittsburgh.—The large jobbing trade is specifying liberally against contracts placed at the lower prices ruling some time ago and are urging the mills for prompt shipments. This tonnage on the books of the mills is pretty well cleaned up, and it is expected will be shipped out within a short time. When this period is reached, a heavier new demand is expected, and the mills anticipate a larger volume of new business within the next month or two. Prices are firm, and we quote Galvanized at \$1.90 and Plain Wire at \$1.60, in carload and larger lots, f.o.b. Pittsburgh, subject to usual terms.

Current Prices.—In the market at large prices are in general pretty well maintained by the jobbers, but there is, as usual, some cutting and more or less diversity in quotations partly on account of their having stocks of goods purchased at low prices. There is also some unevenness in the prices obtainable from manufacturers according to standing of customer, size of order, &c. It is therefore difficult on a number of leading lines to give definite quotations, but on the goods named below the market to the fair retail trade is represented in a general way by the following quotations:

Auger Handles, assorted	dis. 50 and 5 %
Brad Awl Handles	dis. 50 and 20 and 10 %
Chisel Handles, assorted	dis. 50 and 20 and 10 %
File Handles, assorted	per gro. \$1.25 to \$1.50
Saw Handles, varnished	per gro. 9.50
Saw Handles, not varnished	per gro. 8.50
Jack Plane Handles	per gro. 2.50
Fore Plane Handles	per gro. 4.60
First quality Hatchets	dis. 60 %
Second quality Hatchets	dis. 60 and 10 %
Wire Belt Hooks	dis. 80 and 10 and 10 %
Wire Coat and Hat Hooks	dis. 80 and 10 and 10 %
Sad Irons, 4 to 10 lb.	per lb. 3 to 3¼c.
Drawing Knives	dis. 80 and 10 and 10 %
Wire Clothes Lines, 100 ft., No. 18	per doz. \$2.25
Wire Clothes Lines, 100 ft., No. 19	per doz. 1.80
Wire Clothes Lines, 100 ft., No. 20	per doz. 1.58
Cabinet Locks	dis. 33¼ to 33½ and 7½ %
Miscellaneous Wire Nails and Brads	dis. 85 and 10 and 10 %
Square Corn Poppers, 1 qt.	per doz. 75c.
Square Corn Poppers, 2 qt.	per doz. \$1.25
Axe and Pick Handles	dis. 60 and 10 to 60, 10 and 10 %
Hoe and Rake Handles	dis. 30 and 5 to 30 and 10 %
Shovel and Spade Handles	dis. 30 and 5 to 30 and 10 %

Shelby Spring Hinges.—The Shelby Spring Hinge Company, Shelby, Ohio, has been revising the quotations on some of its goods so that the prices of its leading Hinges are now represented by the following quotations:

Buckeye Screen Door Hinges	per gro. \$9.00
Floor Hinges	dis. 50 %
Ball Bearing Hinges	dis. 40 %
No. 177 Sheet Steel Holdback Hinges	per gro. \$9.00
No. 888 Non-Holdback	per gro. 9.00

Cow Ties.—The Oneida Community, Oneida, N. Y., advises us that its Cow Ties should now be quoted in our columns at the following discounts:

American Cow Ties	dis. 35 and 2½ to 40 %
Niagara Cow Ties	dis. 50 %

These revised quotations will appear in the Current Hardware Prices in our next issue.

John Sommer Faucet Company.—The John Sommer Faucet Company, Newark, N. J., has made an advance in the price of its Perfection Cedar Faucets which are now sold at discount 30 per cent. instead of 40 per cent., as quoted in the Current Hardware Prices last week. The leading goods of its manufacture are accordingly now represented by the following quotations:

Peerless Tin Key	40 %
Boss Tin Key	50 %
Victor Metal Key	50 and 10 %
Duplex Metal Key	60 %
Diamond Lock	40 %
I. X. L. Cork Lined	50 %
Reliable Cork Lined	50 and 10 %
Chicago Cork Lined	60 %
O. K. Cork Lined	60 %
No Brand, Cedar	50 %
Perfection, Cedar	30 %

Cast Iron Sinks.—The market for Cast Iron Sinks feels the effect of the higher prices ruling for the raw material, and some of the manufacturers have made slight advances in the prices on Painted Sinks.

Holdback Spring Hinges.—Some of the manufacturers have withdrawn some of their extreme discounts on Holdback Spring Hinges, and the market may be referred to in general as slightly higher.

Bolts, Nuts, Etc.—There will be a meeting of the manufacturers of this line of goods in the near future, when the condition of the market will be carefully reviewed and consideration given to the question whether in view of the strength of the raw material and the good demand a further advance in price would be justified.

Vises.—Slightly higher prices are announced by some manufacturers on Solid Box Vises. There is not, however, entire uniformity in quotations on this line of goods.

Rubber Goods.—The condition of the Rubber market is such as to give a strong tone to the prices for manufactured articles and advances in leading goods made of Rubber are recorded from day to day. Among these may be mentioned an advance of 5 per cent. on Overshoes and about 15 per cent. on Tires, with similar advances not always to the same extent on other lines of goods. The increased demand which has set in, in connection with the improvement in business generally, tends also to the strengthening of the market.

Sash Cord.—There is a firmer market for Sash Cord, although there appears to be no specific advance in the price. A disposition is, however, manifested to quote higher prices to tardy customers who are slow pay, especially those taking less than the quantity necessary to get the low prices. For less than 12 dozens the price is still 24 to 25 cents per pound.

Enameled Ware, Tin Ware, Galvanized Ware, Etc.—Notwithstanding the endeavor of some interests to get an advance of 5 per cent. in these lines, there is no semblance of harmony in prices covering such important groups as Enameled Ware, Stamped Tin Ware, Galvanized Ware and Japanned and Pieced Tin Ware. Buyers are in a quandary as to the future. On the one hand they are assured prices will not advance this year or even early next year by some of the leaders in a struggle for supremacy. The other side of the question concerns advances in sheet steel, tin plate, spelter and many materials entering into the production of these commodities and which eventually must dominate prices. With such conditions prevailing and no stocks of moment on hand, the buyer is puzzled as to whether the present prices should be accepted or take chances on the future. No

one claims to be making money in manufacturing at current rates.

Leather Belting.—There have been advances in Leather Belting in consonance with the upward tendencies in the hide and leather market, and all quotations are made subject to market changes. Some of the reasons assigned for the increases are the scarcity of hides abroad as well as here, with foreign tanners bidding high for hides produced in their own countries. Another feature is the demands for leather that were non-existent 10 years ago, notably the automobile industry, which, it is estimated, will absorb 500,000 hides alone in 1910. At the same time the take-off of hides has relatively fallen much below the increase in population. Then the high price of cereals has in a measure diverted the farmer from stock raising to grain cultivation, while the removal of the tariff, it is believed, has prevented control by interested parties, who could, with the tariff on, have forced hides to even higher levels. Then it should be remembered that hides are only a by-product and cattle are neither raised nor slaughtered for their hides. There appears to be an increased demand for Leather Belting and a firmer market, which is represented by the following discounts:

Extra heavy single and double.....	55 %
Heavy, single and double.....	60 %
Medium, single and double.....	60 and 10 %
Light, single and double.....	60 and 10 and 10 %
Shoulder, single and double.....	75 %
Standard.....	70 and 10 %

Wire Goods.—The Wire Goods Company, Worcester, Mass., has just issued Discount Sheet No. 29, applying to its Catalogue No. 6 and supplements April, 1908, and February, 1909, covering Heavier Wire Hardware, Kitchen Wire Hardware and Special Goods made to order. Among the varied lines of products are Mill Wire Goods, Hooks of various kinds, Garment Hangers, Broilers, Egg Beaters, Potato Mashers, Soap Stands and Brackets, Corn Poppers and Strainers.

Rosin Sized Sheathing Paper.—Rosin Sized Sheathing Paper, owing to increased prices for raw material, has been advanced \$2 per ton, the present quotation for New York City being \$30 per ton. For points in New York State, New Jersey and Connecticut, where the freight rate is not excessive, the price is \$32 per ton, delivered. The rolls contain 500 sq. ft. in 25, 30, 40 and 60 lb. weight per roll, according to specifications.

Oak Tanned Leather Belting.—Under date of the 1st inst. the Missouri Belting Company, St. Louis, Mo., announces a discount of 70 per cent. on its Shortlap Oak Tanned Leather Belting, 60 days net, or 2 per cent. off 10 days, and on all orders aggregating \$40 or over freight will be allowed. The advance is attributed to the increased cost of the raw material.

Lawn Mowers.—The output for next year with many of the makers is about normal, with orders somewhat in excess of those for the corresponding period a year ago. Weather conditions, in this line have more significance and exert a greater influence as controlling factors than customary laws of trade governing sales, and, as in the main the past season was wet, stocks are depleted. While much of the business for the ensuing year has been contracted for at approximately last season's prices, the chances are, it is said, for increases to late comers owing to the condition of manufacturers' order books and advances in materials as well as other essentials incident to the production of lawn mowers. The demand for the higher grade goods is also apparently increasing.

Sheet Zinc.—An advance of ¼ cent per pound is announced by the manufacturers of Sheet Zinc under date of October 9. The price is thus made \$7.75 per 100 lb., f.o.b. mill, in 600-lb. casks, of the thicknesses from Nos. 9 to 19, inclusive, and of the widths from 32 to 56 in., inclusive, and of lengths from 72 to 96 in., inclusive.

Linseed Oil.—A sensational flurry in the Flax Seed market at Duluth took place on October 11, when Seed advanced from \$1.46 per bushel to \$1.61, and closed at \$1.57. In explanation of the cause it is said that crushers were eager to purchase Seed to fill Oil contracts and that shorts were trying to cover. The high price of Seed has not affected the Oil, which is still quoted on the basis of Western Raw at 56 to 57 cents per gallon, according to

quantity. Conditions ruling in the market at this time are unusual. Crushers have little Oil on hand while some have none at all, and demand is good, but for limited quantities. Those who have no Oil will not advance the price and those who have Oil expect that it will go lower when Seed comes in more freely, and therefore do not think it wise to put up Oil prices. Buyers are not always able to get even small lots and crushers are unable to ship desired quantities due on contracts. The receipt of Seed continues comparatively light, farmers evidently holding it back. The reports from field place the crop of Seed from 28,000,000 to 33,000,000 bushels. The estimated crop for 1908 was from 27,000,000 to 28,000,000 bushels, while the actual crop turned out to be only 21,500,000 bushels. Should the present crop prove to be 5,000,000 or 6,000,000 bushels below estimates, prices of Oil would probably go higher rather than lower on a fair demand. The New York market remains unchanged on the basis of 56 cents for Western Raw in 5 bbls. and over; Boiled Oil is 1 cent advance per gallon on Raw.

Animal and Vegetable Oils.—The demand for Lard Oil has alternated between dullness and activity, with an advance in prices of 2 cents on Extra No. 1 and No. 1. The market is represented by the following quotations: Prime Winter Lard Oil, \$0.95 to \$1; Extra No. 1, 59 to 60 cents; No. 1, 50 to 52 cents.

Cotton Seed Oil has been in steady demand, but not as large as for the two preceding weeks. The tendency of the market has been toward weakness, but it has been supported by manufacturers and prices advanced. The following quotations indicate the range of prices: Crude, f.o.b. mill, 5.20 cents to 5.33 cents; Summer yellow Prime, 6¼ to 6½; Summer White, 6¾ to 6½; Yellow Winter, 6½ to 6¾.

Prime Neatsfoot Oil has slightly advanced and is now quoted at 58 to 62 cents. Other lines of Oils, Paints, &c., are without notable change. Quotations will appear under the head of Paints, Oils and Colors in our next issue, as usual.

Metal Workers' Talc Crayons and Pencils.—Stanley Dorgett, 101 Beekman street, New York, the leading producer of Peerless and Perfection Metal Workers' Talc or Soapstone Crayons and Pencils, has issued under date of October 6, a revised list of these goods, showing an addition to the line, as follows:

No.		Per gross.
A	5 x ¼ x ¼ Railroad Crayon.....	\$2.50
1	5 x 1½ x ¼ Rolling Mill Crayon.....	2.10
2	5 x 1½ x ¼ Rolling Mill Crayon.....	2.10
3	5 x ½ x ¼ Metal Worker's Crayon.....	2.10
4	5 x ½ x ¼ Metal Worker's Crayon.....	2.00
5	5 x ½ x ¼ Metal Worker's Pencil.....	1.50
6	5 x ½ x ¼ Metal Worker's Pencil.....	1.50
7	5 x ¼ Round Metal Worker's Pencils.....	2.10

The goods are variously priced in one, two, three and five case lots, as heretofore, each case containing 12 gross, the minimum quantity, or one case, being subject to a discount of 20 per cent, f.o.b. New York, net 30 days, or 2 per cent. for cash in 10 days.

Copper and Brass Goods.—This market, while recording no specific advances in price, has improved in tone and volume of trade. An important interest refers to its business as showing fewer inquiries and more orders, which, while not large, are much more satisfactory, purchasers evidently feeling that low prices now prevail. An exception noted, however, is in bare Copper Wire for electrical purposes, mainly taken in large quantities by heavy buyers, who seem to be holding off for developments.

Spelter.—Spelter has advanced from 10 to 15 points, the price now ruling strong in St. Louis, being at \$6 to \$6.05 per 100 lb., with a New York equivalent of \$6.15 to \$6.20. The opinion is volunteered that these prices will be followed by a higher market, one reason assigned being the demand from galvanizers and brass manufacturers.

Window Glass.—There is a reported improvement in demand for Glass from manufacturers and distributors. Some maintain that prices are being maintained while others take a more moderate view of the situation and say that prices are being better maintained than for some time. According to figures made public, there is now in operation about 1,600 pot capacity from which it is estimated that there is a hand made monthly output of 600-

000 50 ft. boxes, or about enough to provide for the consumptive demand. This estimate does not include the product of the American Window Company. The hope of manufacturers still lies in the formation of the proposed Imperial Window Glass Company, and a meeting is expected to be held before the end of the month to learn what progress has been made, with a view to completing the organization. If this is not possible it is feared that manufacturers' prices will drop. Jobbers' regular quotations are more or less regularly maintained, although quotations have been made on the basis of 90 and 40 per cent. discount on the first 3 brackets single and 90 and 30 per cent. discount on the balance of single brackets. Prices recommended by the Eastern Window Glass Jobbers' Association, from jobbers' list, October 1, 1903, for territory east of the Allegheny Mountains, are as follows: New England States, from jobbers, Single, 90 and 30 per cent., and Double, 90 and 35 per cent.; New York State, Single, 90 and 30 per cent., and Double, 90 and 35 per cent.; New York State, factory shipments, Single, 90 and 40 per cent.; Double, 90 and 45 per cent.; in the Southern States discounts vary from 90 and 20 to 90 and 30 per cent. on Single and from 90 and 25 to 90 and 40 per cent. on Double. Under present market conditions these prices are not always strictly adhered to.

Spirits Turpentine.—Local business has been light during the week, as buyers appear to be well enough supplied to meet immediate requirements. The market has advanced $\frac{1}{2}$ cent per gallon. The New York market is represented by the following quotations: Oil Barrels, 61 $\frac{1}{2}$ to 62 cents; Machine Made Barrels, 62 to 62 $\frac{1}{2}$ cents.

Rope.—A fair demand has characterized the market but has not reached the volume that has been looked for. Some manufacturers report a gradual improvement for the past 30 days, but this is the exception rather than the rule. One manufacturer has put up the price of Rove Jute Rope $\frac{1}{2}$ cent per pound. There is a feeling among manufacturers that if trade shows improvement prices should be advanced, as, owing to high priced fiber and low priced Rope, they have made little money during the past year and some cordage products have been made at an actual loss. The fiber market is firm and Manila has advanced a little. The following quotations represent the market for moderate quantities: Pure Manila of the highest grade, 8 to 8 $\frac{1}{4}$ cents per pound; lower grades of Pure Manila, $\frac{1}{4}$ to $\frac{3}{4}$ cent less than the foregoing quotations. Pure Sisal of the highest grade, 7 $\frac{1}{2}$ to 7 $\frac{3}{4}$ cents per pound, base; Commercial grade, 6 $\frac{1}{4}$ to 6 $\frac{1}{2}$ cents per pound. Rove Jute Rope, $\frac{1}{4}$ in. and up, No. 1, is quoted at 5 to 5 $\frac{1}{2}$ cents per pound. A new fiber is being introduced into this country from Mexico, under the name of Nagney. It resembles Manila fiber in color and general appearance, but is said not to be as strong as the Manila. The promoters expect to have some of the fiber made into Binder Twine, for which use it is regarded as suitable. It can also be used in mixed cordage, as it costs about 1 cent per pound less than Sisal fiber.

STIMULATING FALL BUSINESS.

Methods Employed by Some Merchants.

In the extracts given below from letters recently received from merchants in different States brief reference is made to what they are doing at this time with a view to stirring up interest in their store and stock on the part of the public.

Window, Circular and Newspaper Advertising.

FROM DELAWARE: Window decoration is the most intense advertising we are doing. We have fine windows, the displays in which we change weekly. We are at no loss for material, as our stock embraces a very large variety.

With circular mailing, newspaper advertising and a modern store, as well as window display as above noted, our business has increased this year more than 25 per cent. over the same period of last year.

Special Canvassing on Agricultural Implements.

FROM WEST VIRGINIA: In Agricultural Implements we do considerable canvassing, but on other lines we trust to reputation, assorted stock and regular newspaper advertising.

For new and special goods we use the local papers and window display.

A Sound Platform.

FROM MISSOURI: We believe in advertising in the home papers, daily and weekly, making frequent changes, calling attention to new and seasonable articles.

Good goods, store clean and in order, proper attention to customers and honest dealing, that is my platform for going after business.

Good Live Newspaper Advertising.

FROM IOWA: The writer believes that good live advertising in the local newspapers pays, especially at this season of the year. I inclose clipping from one of our newspapers of a large advertisement lately used.

Our correspondent's advertisement was a well got up four column announcement, occupying a good part of a page, and called attention to selections from the stock

MONDAY—TUESDAY—WEDNESDAY

Extra Special Sale. Three Days Only. Buy Early

We expect the next three days to be the largest of the season. We are making prices to move the goods. You can't go wrong on prices like these

Heading of a Fall Advertisement of an Iowa House.

of Hardware, House Furnishings, Pumps, &c., illustrations and special prices being given. We reproduce herewith, very much reduced in size, the heading of the advertisement, from which it will be noted that the prices thus offered were obtainable only during the special sale, lasting three days.

Special Methods Unnecessary in This Case.

FROM COLORADO: We are not using any special methods this fall to attract business, as it seems to be coming our way without extra effort. People seem to have money and are willing to spend quite a good part of it. Our valley has been blessed with good crops and we are therefore assured of another year of prosperity.

Believes in Window Display, Although a Recent Exhibit Proved Expensive.

FROM CONNECTICUT: In regard to attracting fall business we have found nothing equal to a good window display.

Usually it is quite difficult to trace the results of any kind of advertising, but a recent window display of ours produced results which were immediate and unmistakable. The display consisted chiefly of Revolvers and Ammunition and had been on exhibition only a short time before burglars entered the store and got away with the most costly part of it. This incident, however, does not settle the question, does it pay to advertise?

Special Stove Bulletin.

C. B. Smith, Shrewsbury, Pa., who regularly publishes a monthly store bulletin, entitled "The Hardware News," issued a special Stove number under date of the 1st inst. In it attention is invited to the line of Stoves and Ranges which he handles and which are referred to as of high grade. With a view to drawing out early orders special prices were announced.

THE DUNTLEY MFG. COMPANY, Chicago, Ill., manufacturer of the Duntley Pneumatic Cleaners, has been informed by the director of exhibits of the Alaska-Yukon-Pacific Exposition that the grand prize has been awarded to its Vacuum Cleaners.



This department is open for the discussion of questions which arise in the practical conduct of the Hardware business. Our readers are invited to contribute, submitting inquiries or answering questions.

Correspondents are expected to give their names and addresses, but in order to encourage frank expressions of opinion the advice of our correspondents will be treated in confidence, names and addresses not being published.

For convenience, Questions or Answers should be addressed to THE IRON AGE QUESTION BOX, 14-16 PARK PLACE, NEW YORK.

A Question as to Store Salaries and Wages.

A Hardware firm in Indiana desires to submit this question to the trade, especially to merchants carrying a stock of moderate dimensions and not requiring a numerous force to conduct the business.

What percentage of the total cost of doing business is represented by salaries or wages paid to proprietor, clerks and other help about the store?

So far as the allowance for proprietor is concerned, our correspondent suggests that it should be an amount equal to the actual cost of supporting himself and his family.

Answering the question as applying to their own business, our correspondents state that in their store the proprietor's salary, clerk hire, &c., amount to 60 per cent. of the total expense of doing business, and they are anxious to learn if they are laying out too much money in this direction.

Freight Deducted from Invoices.

We have the following inquiry from a house in the Southwest. Apart from the question asked by our correspondents, it is interesting to note that they sell their goods at delivered prices, the customer deducting the freight from the face of the invoice. It is thus important that the shippers have some method of checking the freight bills thus paid, and the inquiry is for a desirable method of accomplishing this. As things are at present, it is probable that they are often overcharged. Their letter is as follows:

We do a retail and jobbing business in a small way and our freight traffic will amount to about 900 tons per year.

Our jobbing business is along lines that are sold largely at delivered prices, i. e., we allow freight, the customer paying the freight and receiving credit on the return of the expense bill. Our customers usually pay the freight without any question as to the correctness of the charge, and as the average agent at the small stations "travels the line of least resistance," these bills are more often overcharges than otherwise, since they know if they use the highest possible rate they will get enough and it is easier than looking up the correct classification, rate or weight.

These small claims mean a loss of considerable of our profits if they are not properly adjusted, and it is along this line that we need assistance more than any other.

Our correspondents should have little difficulty in meeting the situation. Doing a business not covering a great extent of territory or a complicated system of transportation lines, it is a comparatively simple matter for the shipping clerk to know the rates to the different points where goods are sent. This information can easily be obtained from the railroads. A table of rates or a classified card index of towns might be prepared for reference and the principal points in the field thus covered.

Cutting Prices as a Result of Advertising.

In a city of 25,000 population there are four Hardware firms. One of these advertises extensively in city and adjacent community, direct and through the medium of the newspapers. The advertisements feature certain goods with illustrations and descriptive text and mention prices. The other stores use this information as a means to undercut prices in an effort to secure business. The same applies to the show window advertising done by the house.

Would it be wise for the firm to continue this method of advertising?

The above question comes from a Hardware house in a Western State. Its experience is not unlike other houses whose enterprise in this direction has stirred up competitors to retaliatory measures, who thus pay them the compliment of following their lead. Assuming that the house is pursuing a wise policy in its advertising, it would probably be well for them to continue it, but to change their quotations frequently so that their competitors will not be able to undercut the prices while the sale is in progress. Instead of this they will be kept guessing. Undercutting, as a general thing, is bad business, but the fact remains that it hurts the man who practices it more than it hurts his competitor.

Instead of advertising fixed prices on standard goods to be maintained regularly, it might be better if many of the advertisements treat of small job lots of House-furnishing Goods and other articles, which may often be purchased under the market price of standard goods. These could be advertised at special prices for certain stipulated days only.

Such a course would make it necessary for competitors to wait a few days until they were able to get a job lot of similar goods, or they would have to cut the prices of their standard goods so deeply that they would not care to follow the practice for any length of time.

As a general rule, to quote the remark of a well-known Ohio Hardware merchant, the man who advertises intelligently—with prices—is generally too busy selling goods to pay much attention to any advantage his competitor may get out of it. The same is true of show windows with prices on the goods displayed conspicuously.

THE UTICA DROP FORGE & TOOL COMPANY, Utica, N. Y., has received official notification that a gold medal for quality, construction and workmanship of its Nippers and Pliers has been awarded by the Alaska-Yukon-Pacific Exposition.

The Metropolitan Hardware Company's Establishment.

A Notable Exposition of Modern Ideas in Arrangement and Display of Merchandise.

Sampling carried out on a great scale, so that many goods actually sell themselves — Comprehensive variety of goods handled — Prices adopted designed to yield only a modest return — Sales stands outside the store arrest the attention of passersby and are a source of much profit — An interesting branch store or booth in the great Hudson Terminal Buildings.

First Article.

A conspicuous example of up to date methods of conducting business is afforded in the establishment of the Metropolitan Hardware Company of New York City. Many of the methods followed by this house are radically different from those usually employed in Hardware stores, and some of them will perhaps startle other merchants. The range of prices on nearly all goods carried is a low one, and the policy is to go after many sales, as this results in a more extended advertising of the store because of the larger number of satisfied customers.

The company's establishment is located at the corner of Vesey and Church streets, including 32 and 34 Vesey and 74-78 Church streets. The business was launched in 1879, and for many years it has been known as the largest exclusive retail Hardware store in the downtown section of the city. All goods handled are of standard make, no job lots or auction goods being purchased, and every article sold being warranted.

"Metropolitan stands for quality in Hardware" is a statement given prominence in all the company's ad-

vertising. The policy is to give the customer who wants to buy a single article the same prompt and courteous attention as one who wishes to purchase a large bill of goods. This is carrying out the company's preference to sell 500 items to 500 customers rather than to sell 500 items to one customer.

Store Division.

The building faces south and has two double door entrances, one at the east end and the other at the west end of the store front. In a general way the east side is devoted to Hardware and kindred goods, and the west side to Housefurnishings, Hotel and Bar Goods. There are four aisles extending the length of the building, two from each entrance. The Hardware shelving and draw-

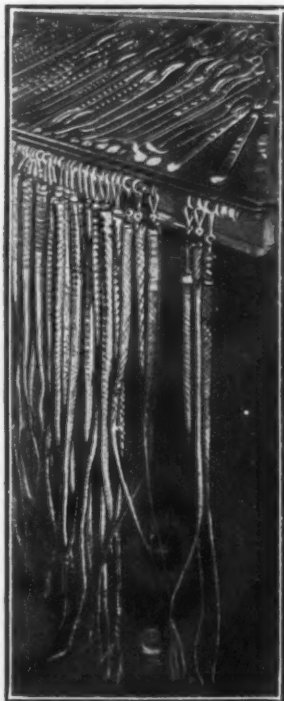


Fig. 1.—A Completely Sampled Line of Dog Furnishings, Including Collars, Leads, Whips, Etc., Representing Everything Pertaining to This Line Carried in Stock.

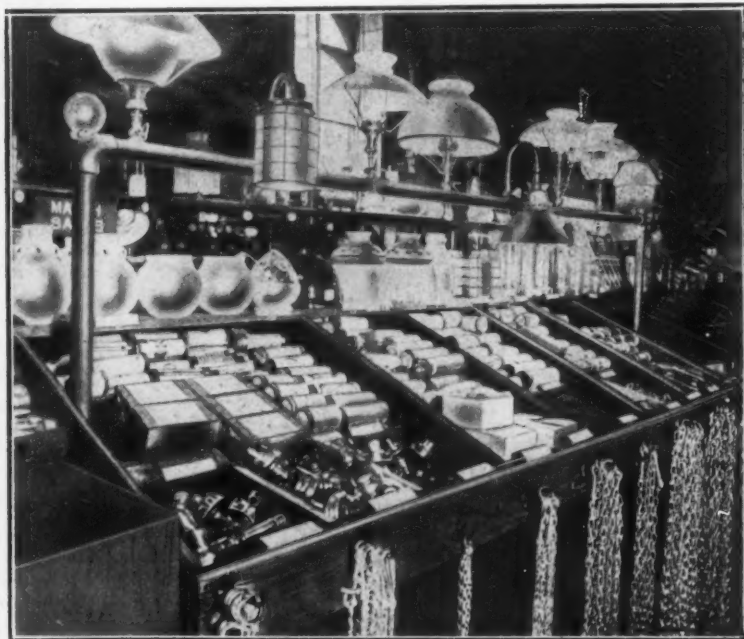


Fig. 2.—An Extensive Display of Gas Lamps and Accessories, Covering Shades, Mantels, Burners, Etc. The Pipe Rack to Which the Lamps are Attached is Supplied With Gas and Lamps are Kept Lighted Throughout the Day.

ers are against the east wall and the Household Utensils against the west wall.

For years the intervening counters and stands were of such a height as to cut off the view of one side of the store from the other side, while in form and arrangement these obstructions were not economical or attractive. Under a recent change in management these counters and stands have been remodeled and lower ones substituted which permit a view of the entire salesroom, and are arranged to display samples and accommodate stock to much better advantage. The work required has been done almost entirely after closing time by the salesmen, under the supervision and with the help of a competent carpenter.

There were two reasons for this: First, that the clerks would feel that they were closely identified with the improvements, and incidentally receive pay for the extra time; and, second, because it was not considered wise to fit up the salesroom with expensive fixtures, in jewelry store style, and so convey the impression that it was a high priced establishment.

The Magnet of Low Prices

The company's prices are lower than can generally be obtained at other stores in Greater New York and surrounding territory. This is made possible by the large quantities of goods purchased from manufacturers, for



Fig. 3.—Rear End of One Section of Display Counter, with Partial Stock of Ice Picks and Lemon Squeezers, also Drawers in Which Stock is Kept.

No. 1 Shingling Hatchets.....	40c.
18 in. Panel Saws.....	95c.
26 in. Hand Saws.....	\$1.35
28 in. Rip Saws.....	\$1.65
3 in. Tinner's Snips.....	85c.
Iron Head Nail Gimlets.....	5c.
5/8 in. Cold Chisels, good.....	10c.
10 in. Agricultural Wrenches.....	34c.
6 in. Family Cleavers.....	25c.
6 in. Butcher Knives.....	25c.
1/2 gill Liquid Fish Glue.....	12c.
4 in. Taper Files.....	5c.
6 in. Taper Files.....	8c.
10 in. Flat Bastard Files.....	15c.
8 in. Button Pattern Pliers.....	30c.
1 in. High Grade Auger Bits.....	60c.
1 in. No. 9 Wood Screws, gro.....	17c.

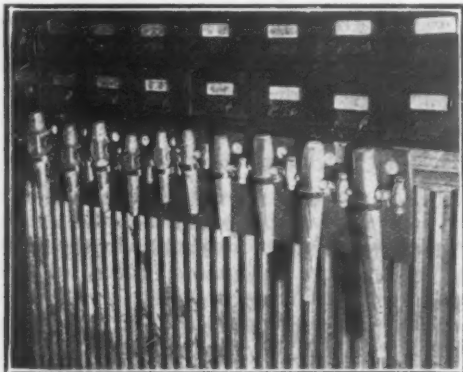


Fig. 4.—Sampling Wooden Faucets on a Board, Which is Attached to Radiator, Partially Shown in Fig. 3.

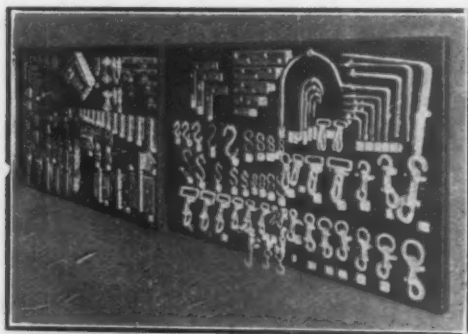


Fig. 5.—Two of Numerous Sample Boards, Hinged on the Top, Displaying Snaps, S Hooks, Corner Irons, Butts, Hinges, Door Pulls, Tacks, Etc. The Boards can be Raised by Customers for Close Examination of Samples.

which cash is invariably paid. The accompanying list of every-day selling goods, with prices at which they are sold singly, will convey a fair idea of the general range of prices throughout the entire stock.

8 oz. Carpet Tacks, 100 count, per box.....	1c.
6 in. Screw Drivers.....	30c.
No. 1 1/2 A. E. Nail Hammers.....	50c.
1 in. Socket Turner Chisels.....	41c.

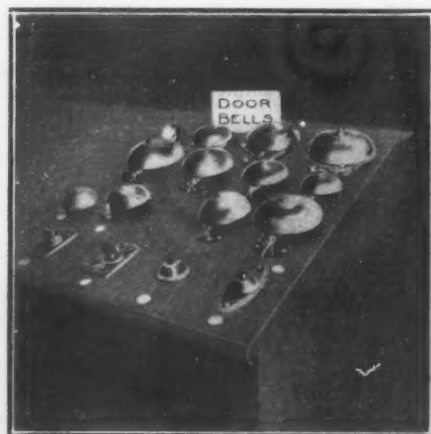


Fig. 6.—Samples of Bell Turns, Pushes and Gongs, on Hinged Sample Board. Turns and Pushes Are Connected with Gongs on the Under Side, as Shown in Fig. 7.

1/4 x 3 in. Carriage Bolts, ea. 2c.; doz.....	10c.
5-16 x 4 in. Carriage Bolts, ea. 2c.; doz.....	12c.
6x8 Jap'd wrought Steel Brackets, with Screws.....	8c.
Carpenters' Chalk, white, red or blue, ea.....	1c.
5 in. Rim Door Locks.....	27c.
3 in. Mortise Door Locks.....	25c.
Door Knobs, Mineral or Porcelain.....	10c.
No. 8 Bright Screw Eyes, doz.....	7c.
No. 13 Bright Screw Eyes, doz.....	4c.
No. 8 Bright Screw Hooks, doz.....	8c.
No. 13 Bright Screw Hooks, doz.....	5c.
3 in. Bright Screw Hooks and Eyes, ea.....	3c.
4 in. Light Strap Hinges, pair, no Screws.....	5c.
4 in. Light T Hinges, pair, no Screws.....	5c.
Common Sad Irons, lb.....	5c.
Side Lift No. 0 Tubular Lanterns.....	50c.
No. 1 Zinc Machine Oilers.....	6c.
No. 2 Zinc Machine Oilers.....	8c.
No. 3 Zinc Machine Oilers.....	9c.

Wood Bench Planes, first quality, Smooth.....	60c.
Wood Bench Planes, first quality, Jack.....	70c.
Wood Bench Planes, first quality, Jointer.....	85c.
1 qt. Square Corn Poppers.....	10c.
1½ in. Jap'd Awning Pulleys.....	5c.
1½ in. Jap'd Screw Pulleys.....	4c.
1½ in. Jap'd Side Pulleys.....	5c.
3½ in. Wrought Hooks and Staples.....	5c.
5 in. Wrought Hook, Hasp and Staples.....	6c.
2 ft. No. 68 Boxwood Rules.....	10c.
No. 103 Blued Steel Squares.....	\$1.10

A Great Variety of Goods.

Upon entering the door on the east side the customer



Fig. 7.—Portion of Sample Counter Devoted Exclusively to Door Bells, Turns and Pushes; Showing How Gongs Connected with Turns and Pushes are Arranged.

first sees shelving along the wall containing drawers sampled with Shelf Hardware. In front of these, with an aisle separating them, are counters, upon which stand showcases. In front of these, with aisles along both sides, are sample counters extending almost the length of the store. The goods are sampled in unusual pro-



Fig. 8.—Electrical Supplies Include Bells, Pushes, Switches, Burglar Alarm Fixtures, Etc., Simplifying the Line for Customers.

fusion and all samples are marked with selling prices in plain figures.

In addition to Shelf and Builders' Hardware, Mechanics' Tools, Mixed Paints, Cutlery and Fishing Tackle, the stock includes Electrical Supplies, Gas Lamps and Accessories, Gas Fixtures, Curtain Poles, Brackets, Rings and Sockets, Tin and Enameled Ware, Hotel Ware, Bar Ware and an almost innumerable variety of small popular novelties. The variety of lines carried almost entitles the establishment to be called a department store.

The Sample Counters.

The sample counters, already referred to, have draw-

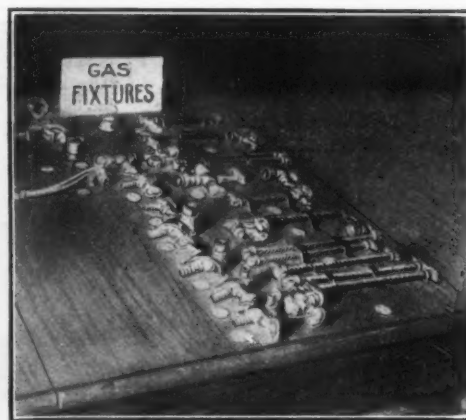


Fig. 9.—Samples of Gas Brackets, Cocks, Etc., Included Under the Designation of "Gas Fixtures."

ers and bins underneath, above which some have bins, as shown in Fig. 2, while others are arranged with sample boards, Figs. 8, 10 and 11; 18 in. wide and 25 in. long, hinged on the upper side to a flat board 12 in. wide, on which are stood various articles, as shown in Figs. 2 and 11. The sample boards are 3 ft. 10 in. above the floor in front and 4 ft. 4 in. at the back, giving customers an excellent view of the goods.

Fig. 3 is an end view of one of the sample counters, from which an idea of their construction can be formed. The sample counters are one of the results of the rearrangement of the fixtures and fully realize the company's expectations in regard to their utility and sale increasing power. **The idea of sampling**, which is carried out as much as possible, is to show all sizes and styles of every line handled, with number or size marked and prices in plain figures, **so that the goods become silent salesmen and customers can make their own selections**, leaving the salesmen in many cases only the labor of wrapping up the articles and taking the cash for them. There are no samples under glass or protected in any way, as the company believes that the average man likes to feel at liberty to handle any article that he is interested in as a prospective purchaser. **The damaging of samples is not considered of much moment compared with the satisfaction derived by the customer from being able to handle them.** Samples are secured by Wire or brass Brass Box Pulls, as most desirable, with price, size, &c., marked on brass bound circular labels tacked beside each article.

Signs Pointing Out Location of Goods.

White cardboard signs, shown in Figs. 6, 8, 9, &c., held in upright position by small stands, tell the location of the goods sampled. The signs are lettered in blue, as the store colors are white and blue. The lettering on the signs is large enough to be seen from quite a distance looking along the aisles.

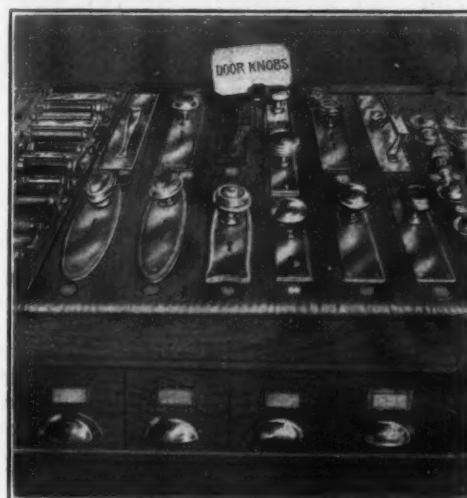


Fig. 10.—Door Knob Sets Represent Most Desirable Styles and Finishes.



Fig. 11.—Upholsterers' Goods.—Sampling Short Sections of Curtain Poles, also Brackets, Rings and Sockets.

Completeness of Sampling.

Fig. 1 gives a suggestion of the completeness with which a line of goods is sampled, in this instance Dog Furnishings. Everything carried in stock pertaining to this line is sampled here, including Collars, Leads, Whips, &c.

In Fig. 2 are shown Welsbach Gas Lamps, Shades, Mantles and other Accessories. The piping is supplied with gas, and some of the Lamps are kept lighted throughout the day, thus making a permanent exhibit, and the others can be lighted to show customers at any time.

The rear end of this section is illustrated in Fig. 3,



Fig. 12.—Auger Bits, Gimlet Bits, Gimlets, Scratch Awns, Countersinks and Expansive Bits, Bit Extensions, Etc., Sampled in Compact Form.

showing samples and partial stock of Ice Picks and Lemon Squeezers. These goods are kept in drawers beneath.

Below these drawers, and attached to a Radiator, is a sample board of Faucets, with sizes and kinds, as shown in Fig. 4.

Hinged sample boards are used quite extensively about the store, for such goods as Snaps, S Hooks, Corner Irons, Butts, Hinges, Door Pulls, Tacks, &c., some of which are shown in Fig. 5, hinged to front of counter, so that customers can raise them for closer inspection.

Fig. 6 illustrates Bell Pushes, Bell Turns and Gongs on one of the hinged sample boards.

Fig. 7 shows the same board raised and represents a unique plan of attaching the Pushes and Turns to Gongs on the under side of the board. This enables a customer

to test the tone of the different sized Bells and the noise they make. The way the stock of the sampled goods is kept is also shown in this illustration.

Electrical Supplies, Fig. 8, include Bell Pushes, Bells, Switches, Burglar Alarm Fixtures, &c.

Gas Fixture samples, including Brackets, Cocks, &c., are shown in Fig. 9.

The full line of Door Knob Sets carried in stock is sampled as in Fig. 10, which include popular patterns and finishes. Reference is made to manufacturers' catalogue for other styles, if desired by customers.

Curtain poles are usually an awkward line to sample, but in Fig. 11 an ingenious method is shown. One-foot pieces of the Poles are shown with ends attached, which answers as well as if a whole Pole of each style was sampled. In connection with these are Brackets, Rings, Sockets, &c., exhibiting the entire line of Upholsterers' Goods carried in stock in a small space.

Wrenches, Tinnets' Snips, Box Scrapers, Screw Drivers, Squares and

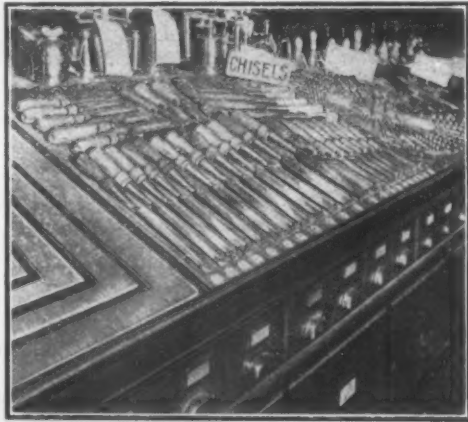


Fig. 13.—Samples of Chisels Include Socket and Butt Chisels, and Gouges in Various Styles.

other tools have full lines sampled in the same manner as Auger Bits and Chisels shown in Figs. 12 and 13. On the same board with the Auger Bits are sampled Gimlet Bits, Gimlets, Scratch Awns, Countersinks and Expansive Bits.

Socket Firmer and Butt Chisels are sampled as in Fig.

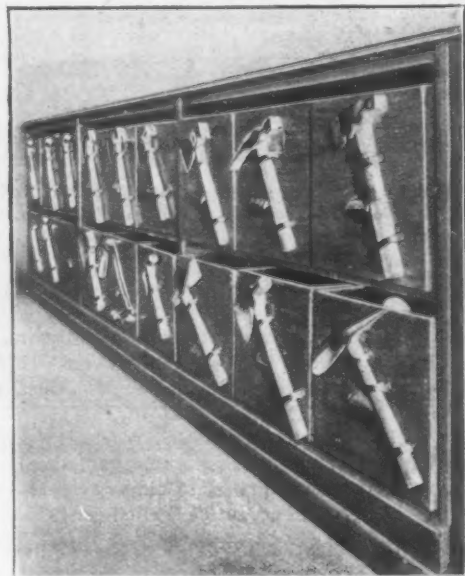


Fig. 14.—Hatchets, Etc., Sampled on Front of Drawers in Which Stock is Kept, Under the Front of Counter.

13, also Gouges, in all sizes carried in stock. A mechanic or an amateur can soon determine what kinds and sizes of tools he wants by looking at the goods and prices. This is equally true of the other sampled articles.

Hatchets of all kinds are kept in drawers under the front of one of the counters, and sampled as shown in

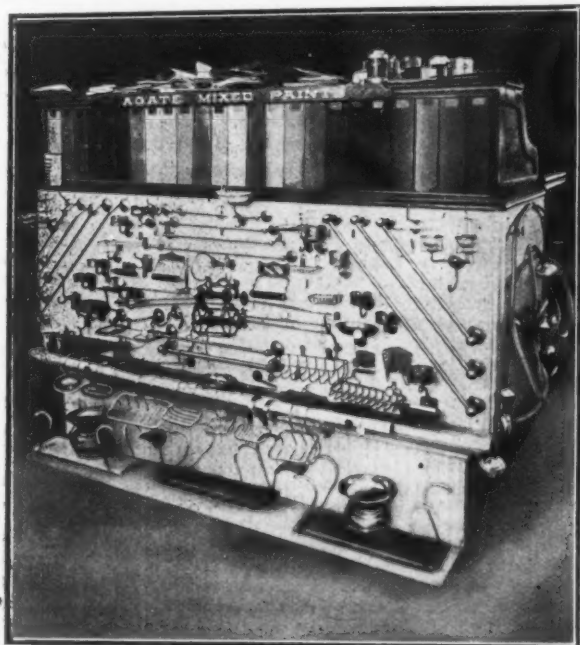


Fig. 15.—Display of Bathroom Fixtures, Sampled on a Background of White Enameled Zinc Imitation Tile, with Color Sample Boards of Mixed Paints Above.

Fig. 14. Hammers, Saws, Hack Saws, Braces, &c., are kept in a wall case near the Hatchets.

An Elaborate Display of Bathroom Fixtures.

On the other side of the store, in full view of the entrance, an elaborate display of Bathroom Fixtures are shown on a background of white enameled zinc imitation



Fig. 16.—A Collection of Pantry Supplies Conveniently Arranged for Customers to Select From and Offering Suggestions for Liberal Purchases.

tile, above which are sample boards of Mixed Paints, as in Fig. 15.

A stock of Pantry Supplies are grouped together for the convenience of buyers, as illustrated in Fig. 16.

[In our next issue we will give a detailed description of the other illustrations of the company's sampling methods as well as an interesting booth which has lately been opened in the Hudson Terminal buildings.]

The Atlantic City Convention.

THE fifteenth annual convention of the National Hardware Association and the seventeenth convention of the American Hardware Manufacturers Association began their session at Atlantic City on Wednesday, October 13, in a joint meeting which was very largely attended, indicating that there will be present at the conventions a larger number of merchants and manufacturers than at any former gathering.

On Tuesday evening the lobbies of the Marlborough-Blenheim had indeed the appearance of a convention under full headway, as there were even at that early date previous to the opening of the conventions, a larger number of manufacturers and merchants, traveling salesmen and representatives of the press and many ladies than heretofore. The arrival early in the evening of the Western delegation on the Chicago special was a notable addition to the attendance and interest of the gathering.

A matter of special importance was taken up at the meeting of the heavy Hardware section on Tuesday evening.

It related to the proposed requirement of the Southern Classification Committee now in session at Washington that boxes of tin plate be strapped or given a higher classification.

It is pointed out that this would be a burdensome and unnecessary requirement and a unanimous resolution was adopted in opposition to it.

The first session was called to order by R. M. Dudley, president of the National Hardware Association, who made a brief and happy address extending a hearty welcome to the gathering, after singing the hymn, "God Bless Our Native Land." Prayer was offered by Rev. John R. Davies, D. D., of Philadelphia.

A very appropriate address of welcome was then made by Hon. Franklin P. Stoy, Mayor of Atlantic City, who in the course of his remarks presented an American flag to the association, as a token that the gathering was indeed a national one. A very pleasant feature was the presentation of a gavel to President Dudley by S. Norvell in a felicitous address.

Mr. Dudley's annual address as president of the National Association referred in a general way to the work of the organization, and especially to the prosperous conditions which prevail and the good fortune of the country in having as Chief Executive a man who will not permit the trade to be menaced by hostile legislation.

He recommended discussion of the question whether agreements between manufacturers in regard to prices are for the benefit of the trade and also touched upon the important matter of resale prices. This address was followed by Secretary Fernley's annual report, in which a more detailed view was given of the activities and usefulness of the association.

Two addresses were then made by F. D. Mitchell, secretary of the American Hardware Manufacturers' Association and by G. C. Seybold, who, in the absence of Mr. J. Hardy, spoke on behalf of the Canadian Hardware Association. An interesting discussion was then held in regard to the future and the return of prosperity such as has characterized past years.

This discussion was opened by Robert Garland, president of the American Hardware Association, after which S. Norvell, of the Norvell-Shapleigh Hardware Company, of St. Louis, spoke from the standpoint of the jobber, and R. R. Williams, of *The Iron Age*, as the representative of the trade press.

Death of John D. Warren.

AFTER a period of declining health of more than a year's duration, John D. Warren, founder and head of the John D. Warren Mfg. Company, Chicago, died on the 26th ult. at the Chicago Athletic Club, where he had lived for the past two years. Mr. Warren was widely known to the Hardware trade as an expert designer of store equipment, to the development of which he brought a knowledge of practical requirements born of a life-long experience in the sale and distribution of Hardware.

Born July 17, 1848, at Oakfield, N. Y., and graduating at Lima Seminary, he commenced his business career at an early age in Buffalo, N. Y., where he learned the Hardware trade with Pratt & Co. Later he became the Western representative of this concern, with headquarters in Chicago. After 15 years of service with Pratt & Co. he became identified with the sales department of the Simmons Hardware Company, St. Louis, Mo., in which



JOHN D. WARREN.

position he remained nine years, withdrawing finally to embark for himself in the designing and manufacture of Hardware store equipment.

The problems involved in this enterprise were not merely those incident to the manufacture of goods, but embraced a strenuous campaign of education which called for indomitable energy and extraordinary capacity for developing new ideas, together with tireless, aggressive and persistent effort. All of these qualities Mr. Warren possessed, and, inspired by a deep seated conviction in the utility and advantage of orderly system in the arrangement and handling of goods, he succeeded in creating a product that has gone far toward revolutionizing Hardware store methods and winning at the same time wide popularity, not only in the United States, but in foreign countries as well.

Mr. Warren was distinguished by a genial personality, coupled with acute judgment; he also possessed a genius for invention and artistic skill, combined the practical with the beautiful and placed the stamp of individuality upon his work. A typical example of his creative power will be recalled by all who viewed the Warren Model Hardware Store exhibited in the Palace of Industries at the Louisiana Purchase Exposition some years ago.

IN THE SUIT brought in the United States Circuit Court, Southern District of New York, by the Smith & Hemenway Company against Underhill, Clinch & Co., New York, and the Reid-Edelmuth Mfg. Company, Brooklyn, N. Y., respectively sellers and manufacturers of the Champion Ice Cream Freezer, it was ordered and decreed on October 7 that the bill of complaint be dismissed with costs. The contention of the Smith & Hemenway Company was that the Champion Freezer was an infringement of its Polar Star Freezer.

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Be his

My special thanks, whose even-balanced soul,
From first youth tested up to extreme old age,
BUSINESS COULD NOT MAKE DULL, nor
passion wild;
Who saw life steadily, and saw it whole.

—Matthew Arnold.

Ten Maxims for Employees as Promulgated by a Large Mercantile House.

1. **Don't lie.** It wastes our time and yours. We're sure to catch you in the end and that's the wrong end.
2. **Watch your work, not the clock.** A long day's work makes a long day short and a day's short work makes our face long.
3. **Give us more than we expect** and we'll pay you more than you expect. We can afford to increase your pay if you increase our profits.
4. You owe so much to yourself that you can't afford to owe anybody else. **Keep out of debt** or keep out of our employ.
5. **Dishonesty is never an accident.** Good men, like good women, can't see temptation when they meet it.
6. **Mind your own business** and in time you'll have a business of your own to mind.
7. Don't do anything **which hurts your self-respect.** The employee who is willing to steal for us is capable of stealing from us.
8. It's none of our business what you do at night, but **if dissipation affects what you do next day,** that is our business, and you won't last long with us.
9. Don't tell us what we'd like to hear, **but what we ought to hear.** We don't want a valet to our vanity, but we need one for our dollars.
10. **Don't kick if we kick.** If you are worth while correcting, you're worth while keeping. We don't waste time cutting specks out of rotten apples.

The Frost That Blights.

A man's progressiveness is often measured by the way he receives a suggestion from an employee.

A salesman in a Hardware store said to the manager, "Don't you think it would be a good idea to cut a door through that wall? We have the same kind of goods on both sides, and have to go all the way up to the other end every time we want to get through."

"Well," drawled the manager, "I guess if we can afford to pay you for your time, you can afford to take the trouble to walk around there. You sell the goods, young man, and I'll decide when to tear down the walls."

About three months later the young man had so far forgotten the sting of the former rebuff that he grew bold enough to make one more suggestion.

"If we had a medium size of this Wrapping Paper I think it would save a good many sheets of this large size in the course of a day."

"You think so? Well, you attend to your customers and we'll try to provide enough paper to wrap the goods up in."

What a wholesome atmosphere to work in!

How it must unfold the buds of original thought—like the gentle spring rain falling on the grass and trees, or the warm sunshine that brings out the apple blossoms!

Or—but may be it's only a cruel frost that kills the flowers.—W. P. Warren.

The Real Preparation.

Victories of life are won, not on the fields nor in the marts where the decisive struggle takes place, but in the obscure and forgotten hours of preparation. Success or failure lies in the hands of the individual long before the hour of final test comes.

In the higher fields of success there are no accidents; men reap precisely what they have sown, and nothing else; they do well precisely what they have prepared to do, and they do nothing else well.

The world puts its force into us when we put ourselves in right relation with it; experience makes us constantly wiser if we know how to rationalize it; time deposits all manner of treasure in our memory and imagination if we hold the doors open.

Nothing is lost upon a man who is bent upon growth; nothing wasted on one who is always preparing for his work and his life by keeping eyes, mind and heart open to nature, men, books, experience. Such a man finds ministers to his education on all sides; everything co-operates with his passion for growth. And what he gathers serves him at unexpected moments in unforeseen ways. All things that he has seen, heard, known and felt come to his aid in the critical moment to make his thought clear and deep, his illustration luminous, his speech eloquent and inspiring.—Hamilton Wright Mabie.

Death of Edward E. Magovern.

EDWARD E. MAGOVERN died October 7 at Atlantic Highlands, N. J. He entered the Hardware business as an employee of the Yale & Towne Mfg. Company, April 1, 1892, to represent them in the exhibit it made at the World's Fair, Chicago, in 1893. He was then put in charge of the export business at the Stamford, Conn., works, and subsequently became superintendent of the Branford, Conn., plant of the company, which position he held from 1894 to about 1900. He then became general sales manager at Stamford and the New York office from 1900 to 1904, when he severed his connection with the Yale & Towne Mfg. Company to become Hardware commissioner for the line of Builders' Hardware manufactured by the leading makers in that important field, holding the position from 1904 to the spring of 1909. Mr. Magovern was energetic and competent and served in the various positions he held with much satisfaction to his superiors.

THE SHELBY SPRING HINGE COMPANY, Shelby, Ohio, manufacturing Double Action Spring Hinges and Builders' Hardware Specialties, has taken a commodious office at 50-52 Franklin street, New York, in the new Hardware district having outgrown the accommodations at 84 Chambers street. With the more ample space at hand a much larger stock will be carried than heretofore, and it will be the endeavor always to have on hand goods in all finishes with which to execute hurry orders. The stock formerly carried in Boston has been removed to New York and the New England trade will be handled from the New York headquarters, which as in the past, will be in charge of J. N. Limeburner, sales agent.

THE H. D. TAYLOR COMPANY, jobber of Iron and Steel and Carriage and Automobile Supplies, 103-107 Oak street, Buffalo, N. Y., will erect a warehouse addition 66 x 175 ft., three stories in height.

The \$20,000,000 Postal Deficit

**Postal Officials Staggered and
a Searching Investigation
in Progress**

**A Complicated Situation Which May
Bring About Radical Reforms
in the Service**

FROM OUR SPECIAL CORRESPONDENT.

WASHINGTON, D. C., Oct. 12, 1909.

THE official announcement recently made that the postal deficit for the fiscal year ended June 30, 1909, figures out the enormous sum of \$20,000,000, breaking last year's high-water mark record by \$4,000,000, has attracted much attention among business men throughout the country and has aroused apprehension among retail merchants in all lines lest the campaign set on foot by the late Postmaster General Meyer may be renewed with increased vigor by his successor, Mr. Hitchcock, when Congress reconvenes next December. The situation is a most interesting one, and is complicated by many important factors, but the correspondent of *The Iron Age* is in position to shed considerable light on the outlook which warrants the close attention of those who have opposed a domestic parcel post, a post check currency, and other so-called postal reforms.

Colossal Deficit Induces Searching Investigation of P. O. Departments.

The record-breaking deficit for the fiscal year just ended has fairly staggered the postal officials and has forced the new Postmaster General to institute a searching investigation of each department of the postal service to determine, first, the causes that have contributed to the annually increasing shortage; second, the remedies that can properly be applied; and third, whether these remedies are within the authority of the executive branch of the Government or must depend upon legislation.

It is possible to summarize here briefly the chief causes that have contributed to the last colossal deficit, for sufficient progress has already been made in the investigation now on foot to locate the biggest leaks. Some of these gaps can be stopped by executive order, but legislation will be required to close those which are responsible for the greater part of the deficits reported during the past four or five years.

Fee for Registered Letters Will Be Increased From 8 to 10 Cents.

In beginning his investigation of the postal service Mr. Hitchcock took up the registered letter system which he had already examined into while First Assistant Postmaster General. On this branch of the service the Department has spent much money in recent years not only for current maintenance but for advertising purposes. The experts employed in the investigation of the registry service, however, had no difficulty in demonstrating to the Postmaster General that the Government has lost large sums since the registration fee was reduced from 10 to 8 cents and especially since the Department first undertook to boom the registration service by placards displayed in post offices, special instructions to local postmasters, etc. The fixing of the fee for registra-

tion is within the authority of the Postmaster General, and in view of the data secured by the experts it has been decided to return to the 10-cent fee, which there is reason to believe will place this branch of the service on a self-supporting basis. This will be accomplished not only by reason of the increased fee but through the reduction in the volume of the business now conducted at a loss.

Money Order Division Has Been Conducted at Great Loss.

The Postmaster General next turned his attention to the money order division in which a staff of no less than 40 experts is now engaged in making an exhaustive investigation. Some exceedingly interesting facts have already been unearthed. It appears that during the last administration of the Department this branch of the service was tremendously expanded in anticipation of the passage by Congress of a bill authorizing the establishment of postal banks, and it is said that no less than 7,000 unnecessary money order offices were thus created.

In addition certain costly changes in the administrative regulations belonging to this branch of the service were also made. The cost of carrying on the money order business by the Government has always materially exceeded the outlay of the express companies for a similar service and the necessity of keeping fees approximately at a parity with the private concerns has made it necessary for the Government to do this business at a loss, which has not been disclosed because of the bookkeeping system in vogue in the Department.

Mr. Hitchcock's experts will doubtless be able to determine the exact cost of doing this business, and as it goes without saying that a large number of unnecessary offices will be discontinued and the regulations revised with a view to dispensing with all red tape not necessary for the protection of the Government and the patrons of the service, an important economy can be effected.

Postmasters' Supplies Will be Sent by Freight—A Strong Argument Against Domestic Parcel Post.

It has long been the practice of the Post Office Department to send supplies to postmasters through the mails, and while this matter has been franked by the Department it has been indirectly paid for at a relatively high rate in the settlements with the railroads for the carrying of the mails. At one time it was the practice of the Department to ship miscellaneous merchandise of every kind belonging to the Government, including furniture for post offices, etc., and the charges for this service sometimes equalled the value of the goods transported. Mr. Hitchcock has changed all this by an executive order recently issued under the terms of which the greater part of the post office supplies distributed from Washington and other supply depots will be sent by freight at greatly reduced cost. It would be difficult to find a stronger argument against a domestic parcel post than the Postmaster General's order referred to.

Payments to Railroads for Mail Carriage.

The next leak which the Department hopes to stop is in connection with the payments to railroads for carrying the mails, which are believed to be excessive. The annual disbursements for this service now exceed \$50,000,000, from which it will be seen that a small percentage reduction would make a substantial cut in the current deficit. Several commissions have examined into this matter, but none of them have gone to the vital point, namely, the cost to the roads themselves of doing this business for the Government. The Postmaster General, however, has decided that the Department is entitled to this information and has called upon the railroads to furnish it within the next 30 days and, in order that the data may be comparable and in shape for accurate compilation, the Department has prepared a series of forms upon which the railroads have been requested to make their returns. It is confidently believed that the results of this inquiry will justify a recommendation to Congress for a decrease in the annual appropriation

for carrying the mails that will aid materially in closing the gap between the postal revenues and expenditures.

Expensive Franking Privileges of Senators and Representatives.

Excepting perhaps the reckless extension of the rural free delivery service during the past decade, nothing has contributed so much to the postal deficits of recent years as the franking privileges enjoyed not only by Senators and Representatives, but by all the executive departments. This abuse has increased enormously within the last four years and has carried with it a vastly increased expenditure for public printing which is not disclosed in the postal deficit, although it helps to swell the enormous annual Treasury deficit which has steadily climbed to the \$100,000,000 mark.

The franking privilege of Senators and Representatives is exceedingly costly to the Government, as it covers not only the transmission of printed matter but of a vast amount of first-class mail for which the Government must pay the railroads in addition to defraying the expense of distribution and delivery. Senators and Representatives have discovered that there is no more effective method of securing local popularity than to distribute well printed, handsomely illustrated Government publications with a lavish hand, and as this can be done without paying postage bills and with only such clerical labor as is supplied from the contingent fund of the two Houses, the result has been not only an enormous charge upon the postal service for transportation and delivery but a heavy demand upon the Government printing office for large editions of popular and expensive documents. The records of Congress disclose hundreds of resolutions for reprints of handsomely illustrated books the cost of which does not appear separately in any published report.

Public Document Distribution a Heavy Tax.

The distribution of public documents by the Department, however, is probably a heavier tax on the postal service than the Congressional mail, and this is especially true as applied to the past four years. During the administration just ended a large number of special commissions were appointed by the President, with or without authority of law, and also by Congress. These commissions rendered elaborate reports, in many cases accompanied by detailed testimony, and all this matter was printed at the public expense and distributed through the mails under special franks not only to all persons requesting copies but to long lists of addresses obtained by great labor by the commissions themselves, the members of which desired to secure the widest possible distribution for the results of their labors. The cost of the distribution of these special reports must have been a very large item in the deficits of the last four years.

Rural Free Delivery Will Be Investigated.

That the rural free delivery service has been extended in many districts far beyond the local needs has long been conceded by the postal authorities and during the past two years strong efforts have been made not only to prevent the establishment of unnecessary routes but to consolidate those already in existence. There is a great field here for the pruning knife, and it is understood that Mr. Hitchcock contemplates a rigid investigation of the most comprehensive character. This inquiry will show not only the character of the service as now performed but its effect upon the local community and the conditions which should govern the extension or contraction of the service in the future.

A Pointer for Retail Merchants.

Readers of *The Iron Age* will remember that when the committee representing the hardware retailers and local merchants in other lines called upon Postmaster General Hitchcock last spring to protest against the establishment of a local parcel post he went so far as to say that, while he would not undertake to outline his policy in this respect, he would pledge himself to take no action until after careful investigation. This inquiry

is now in contemplation and there is good reason to believe it will be most exhaustive.

Retail merchants in all parts of the country should bear in mind the fact that the investigation is under way and be prepared to furnish information to officials of the Government whenever it may be called for, either by inspectors in the field or by the Department at Washington. The Postmaster General is following a conservative course respecting the rural parcel post question which is in marked contrast with the policy of his predecessor, and is the more commendable on that account.

It hardly seems possible that the inquiry regarding the rural service can be completed and the data digested in time for the transmission to Congress at its coming session of recommendations, except possibly with reference to the amount of the appropriation desired for the next fiscal year. At the same time, however, it would not be wise to count upon a postponement of this matter, and retailers and their associates should prepare themselves to meet any possible suggestions looking to the resurrection of Mr. Meyer's pet project.

Rural Carriers' Plans Will Probably Meet with Disappointment.

The national organization of rural carriers has seized this particularly inopportune occasion to bring forward a plan for the pensioning of carriers who become superannuated or who may be injured in the line of duty. Bills providing for these pensions have been prepared and will be introduced when Congress reconvenes. They will be accompanied by measures raising carriers' salaries, providing them with horses and equipment at Government expense, &c. Under the circumstances they will probably find a safe resting place in the pigeon-holes of the post office committees of the two houses.

Whatever may be the fate of the rural parcel post project it will be urged by its advocates on the ground that it will decrease rather than increase the annual deficit; as for the bills providing pensions and increased salaries and allowances for carriers, they spell nothing but a tremendous addition to the current shortage and will stand no chance whatever with the leaders of the two houses.

Parcel Post Boomers Full of Courage.

That the advocates of a domestic parcel post, and especially the boomers of a package service on rural routes, hope to make substantial progress next winter is indicated by the work now being done not only by the big catalogue houses but by such organizations as the Parcels Post League and the United Business Men's Association, the latter being a new organization that has been recruited from among the merchants of the big cities who are anxious to extend their mail order business.

This latter association recently sent out a circular letter to several thousand business men soliciting replies to a series of a dozen questions with respect to express and postal matters and designed to elicit information regarding the desirability of establishing a parcel post. These associations regard the proposed package service on rural routes as an entering wedge for a general parcel post and would be disposed to favor it even though it should be established under the narrow and unconstitutional conditions incorporated in Mr. Meyer's last bill dealing with the subject.

Opposition to Postal Banks Spreading.

The situation with respect to a domestic parcel post is somewhat affected by the campaign now on foot to secure the passage of a bill authorizing the establishment of postal banks. This measure was favorably reported by the Senate Post Office Committee in the last Congress and will be urged by certain administration leaders next winter. President Taft in his tour of the country, recently begun, is advocating it strongly on the score that the Republican party stands pledged to it by reason of the utterances in the last national platform. The bankers of all classes have been thoroughly aroused against this project, however, and are now fighting with

great vigor to recover the ground lost through their apparent indifference when the subject was first broached. The progress made by the friends of postal banks before the bankers awoke to the seriousness of the situation should be a lesson to all opponents of domestic parcel post, whether limited to rural routes or not.

The Sullivan System's Assistant Buyer.

THE Sullivan System, Inc., 280 Broadway, New York, has issued a revised edition of "The Assistant Buyer," a loose leaf buyers' reference book of manufacturers' names, brands and list prices. The book is issued in two volumes, for convenience in handling. Volume 1, pages 1 to 1186, covers Tools for all trades, Machinery for metal and wood working, for sawmills and miscellaneous Machinery and Supplies for steam, plumbing and gas, mills, mines, railroads, ships, machine shops, contractors, together with Electrical Supplies.

Volume 2, pages 2000 to 3000, covers Heavy and Shelf Hardware, from Nails to Cutlery, including Bolts, Nuts, Washers, Blacksmiths' Supplies, Wagon Woodstock, Builders' Hardware, Paints, Oils, Sporting Goods, Tinware, Wooden Ware and innumerable Specialties.

A helpful new feature is the inclusion of many illustrations of some manufacturers' lines, with accompanying price-lists, which, with the trade name of the article commonly given under the proper classification, often simplifies the locating of an article and to some extent makes the work a universal catalogue as well as directory.

In the voluminous index all subjects have been double indexed and in addition to a thorough revision the new books, it is said, contain approximately 33 1-3 per cent. additional information.

Requests for Catalogues, Etc.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM ARNOLD L. BURD, who has opened a new store at 1534 North Capitol street, Washington, D. C., handling Hardware Specialties, Heavy Hardware, Builders' Hardware and Wood and Willow Ware.

FROM SMITH & BROWN, who have purchased the retail business of A. G. Serr, in Tyndall, S. D., and will handle Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Window Glass, Oils and Sporting Goods.

FROM I. LEVY & SON, Passaic, N. J., who will remove to 204 Dayton avenue on or about October 25, where they will have a store twice as large as the present quarters. The goods handled include Hardware, Tools, Paints, Sporting Goods, House Furnishings and Plumbers' Supplies. The firm is also interested in job lots.

FROM STANBERRY HARDWARE COMPANY, which has purchased the business of the Harden & De Moss Hardware & Implement Company, Stanberry, Mo., handling Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Agricultural Implements, Paints, Oils, Sporting Goods, Vehicles and Wagons.

THE KEUFFEL & ESSER COMPANY, Hoboken, N. J., and 127 Fulton street, New York, has just received notice that a grand prize has been awarded to it on the line exhibited at the Alaska-Yukon-Pacific Exposition, which in a general way included Drawing Materials, Mathematical and Surveying Instruments and Measuring Tapes.

A loss by fire estimated at \$75,000 has been sustained by the Tausche Hardware Company, La Crosse, Wis., jobbers of Hardware and Stoves.

Price-Lists, Circulars, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of new catalogues, price-lists, &c., for notice in this column and for filing in our Catalogue Department.

E. T. FRAM LOCK COMPANY, Lancaster, Pa.: New York office, 37 Warren street: Catalogue No. 20, illustrating and describing Pressed Steel, Wrought, Cast and Malleable Iron, Steel, Bronze, Brass, Nickel and Aluminum Padlocks, and Night Latches. In Padlocks old designs have been reconstructed, improved and modernized, obsolete patterns dropped and over 75 new numbers added.

KNAFF & SPENCER COMPANY, Sioux City, Iowa: New pages, 84 in number, dated October 1, 1909, for insertion in the company's loose leaf catalogue, covering a wide range of goods.

WABASH CABINET COMPANY, 296 Broadway, New York: Folder devoted to a few of the company's Junior Unit Filing Cabinets and supplies for card indexes and letter files.

MAJESTIC FURNACE & FOUNDRY COMPANY, Huntington, Ind.: Catalogue No. 8, illustrating the Majestic Warm Air Heating System and Majestic and Model Coal and Wood Chutes for residences and other buildings. The Model Chute not only furnishes ample protection to a building, but also acts as a window. The glass can be removed and screen wire substituted, if desired.

R. M. BOWSER & SON, Renfrew, Pa.: Circular illustrating the Bowser Wire Cloth Display Rack, with and without rewinding device, the latter for use only when rolls of cloth are damaged in shipping or from other causes. The Rack is made in two sizes, holding seven and nine rolls of cloth.

W. & B. DOUGLAS, Middletown, Conn.: Frost Insecticide Company, Arlington, Mass., selling agent: Booklet S1, devoted to Power Sprayers. Illustrations are given of the following Sprayers: Woodland, Brockton, Charter Oak, Granger, and the Woodland Tank.

CHARLES MORBILL, 277 Broadway, New York: Illustrated catalogue, 16 pages, describing Saw Sets, Nail Pullers, Bench Stops, Hand Punches for metals and other materials, Lead Seal Presses, Liquid Soap Urns or Containers and the Pearson Cyclone Railroad Spike Puller.

LANDERS, FRARY & CLARK, New Britain, Conn.: Catalogue showing the firm's complete line of Universal Chafing Dishes, Percolators, Coffee Machines, Coffee Machine Sets, Trays, Sugar Bowls, Cream Pitchers, Alcohol Flagons, Wind Shields, Alcohol Stoves, &c. It also illustrates Electric Percolators. The catalogue makes an effective showing of the entire line, which includes many new patterns.

JOHN A. GAUGER & Co., West Twenty-second and Laflin streets, Chicago, Ill., have arranged with C. K. Turner & Son, Inc., 116 Broad street, New York, to handle their export trade in Mantels, Grilles, Parquetry Flooring, Embossed Molding, Fancy Front Doors and Windows, Prepared Roofing, &c., in the following countries: Australia, South and Central America, Mexico, South Africa, Europe, India, Hawaiian and Philippine Islands and the West Indies.

L. A. DADE has purchased the Jones Hardware business in Chickasha, Okla., including Shelf and Heavy Hardware, Stoves, Tinware, House Furnishings, Paints, Oils and Sporting Goods. Some improvements in the store will be made and new lines added.

W. H. HAITH, Brock, Neb., has purchased the business of Bailey & Catchart, handling Shelf and Heavy Hardware, Stoves, Tinware, Housefurnishings, Agricultural Implements, Paints, Oils and Sporting Goods.

A Convenient Rack for Accommodating Manufacturers' Circulars, Book- lets, Etc.

THE Weaver Hardware Company, Rochester, N. Y., has in use the Rack shown herewith, for holding circulars, booklets, &c., furnished by manufacturers in large quantities, and is also in a position to fill orders for the Racks, having had a quantity of them made for this purpose. The need of some such receptacle in which to keep, in orderly array, the trade literature which is furnished to merchants for distribution to their customers has been felt in many stores. All of this printed matter is valuable and helpful to the business if it can be found at the right time, to wrap the packages of goods or to hand to customers. There is no doubt a great waste of this business-getting literature, as it is apt to be laid loosely on a counter or on a shelf underneath, where it is soon forgotten, or it finds its way to the floor, and then is burned with the sweepings.

The Rack is built somewhat on the principle of a railroad timetable Rack, and provides a compartment for each bunch of circulars or pamphlets, the upper portion being in full view so as to be found readily. Each compartment has a capacity or depth to hold about 150 single sheet circulars of ordinary paper thickness. Many folders or booklets are of course of such a thickness that only a limited number can be held in each compartment, but even then the compartments provide a supply sufficient for current use and the Rack can be replenished from the surplus stock of printed matter as needed.

The dimensions of the Rack over all are 32¼ in. high, 30½ in. wide and 5½ in. thick, and there are 75 compartments, these varying from the size of circulars of ordinary envelope proportions to good-sized catalogues. The Rack is the unit of construction and can be duplicated to any extent required.

Ermina Aluminum Enameled Ware.

The Central Stamping Company, 172-174 Fulton street, New York, has brought out the Erlma aluminum enameled ware. It is offered as a high grade white enameled ware with blue-black edges and trimmings, four coated and particularly well finished. The bails have mahogany finished wood handles, the tin covers are recoated and have metal knobs that cannot become detached. All holes in ears or elsewhere have brass rims for protection in hanging. Every piece is guaranteed by the company absolutely free from any kind of poisonous substance. The line is shown in illustrated descriptive catalogue, No. 31, just being distributed and includes tea pots, coffee pots and boilers, kettles, sauce-

pans and pots and a large assortment of kitchen utensils and household articles.

The Union Hardware Company.

The Union Hardware Company, Torrington, Conn., and 95 Chambers street, New York, has recently taken over the line of Champion screw drivers formerly manufactured by the Tower & Lyon Company. The entire



The Rochester Circular Rack Having 75 Compartments, Accommodating Printed Matter from the Size of Circulars for Ordinary Envelopes to Good Sized Catalogues.

assortment will be made as heretofore, consisting of 10 sizes, ranging from 2½ to 12 in. regular; eight lengths of blades 2½ to 12½ in. in the Champion Cabinet pattern and in the Champion machinists' style with double grip fluted handles, 12, 15, 18, 24 and 30 in. lengths, together with special styles, No. 112, with 1½-in. blades and No. 134 having 1¾-in. blades. The Union Hardware Company will also hereafter manufacture the Perfection miter boxes and Chaplin's planes.

The Maine Mfg. Company's 1910 Line of Refrigerators.

The Maine Mfg. Company, Nashua, N. H., is now offering its stone white refrigerators with rounded corners and walled with slabs of solid stone direct from the quarry. The stone is referred to as being indestructible and an excellent cold retainer. The White Mountain Grand refrigerators are now made with open tops, round corners and have provision chambers in pure baked white with wire shelves. The hardwood line of refrigerators is equipped with the removable patent Maine grate.

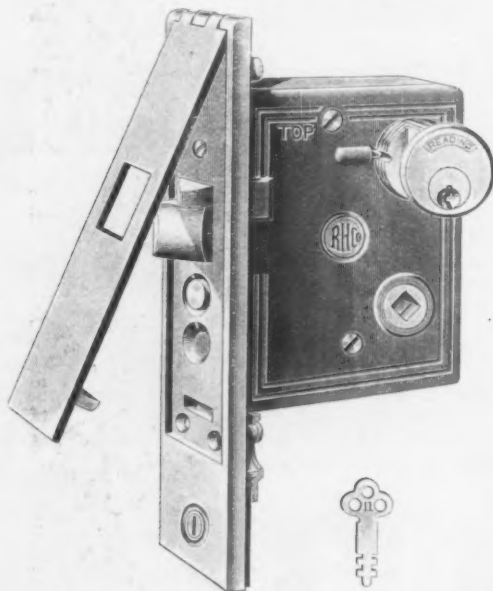
The Reading Cylinder Protected Front Mortise Knob Latch.

The Reading Hardware Company, Reading, Pa., and 50-52 Franklin street, New York, is manufacturing the Reading cylinder mortise knob latch and anti-friction latch bolt. It is operated by knobs from both sides and by key on the outside only. The outside knob may be set



The Clauss Corruqa Razor Strop.

by stops in the face of the lock. These latches are especially adapted for doors in offices and public buildings where it is desired to control the operation of the door. When the knobs are set by stops the latter are protected by covering the front under lock and key, thus preventing



The Reading Cylinder Protected Front Mortise Knob Latch.

any interference or tampering with the operation of the door. The latch is not reversible; three German silver keys are sent regularly in any desired number of changes; there is a bronze hub for $\frac{3}{8}$ in. swivel spindle and the locks are packed complete with screws.

The Twentieth Century Mail Box No. 6.



The Twentieth Century Mail Box No. 6, Constructed of No. 24 Sheet Steel, and Finished with Best Baking Japan.

The W. F. Heise Mfg. Company, Chicago, Ill., has added to its line of Twentieth Century mail boxes the style here shown, which is designated as No. 6. It is a small compact receptacle constructed of No. 24 sheet steel and is finished with the best baking Japan to protect it from corrosion. The box is not furnished with lock or key, but it can be fastened with a padlock if desired. A hinged lid fits over the slotted opening in the top, making it absolutely rainproof. The dimensions of the box are: width, 5 in.; height, 9 in.; depth, 2 in., and its shipping weight is 200 lb. per gross. They are packed six boxes in a case.

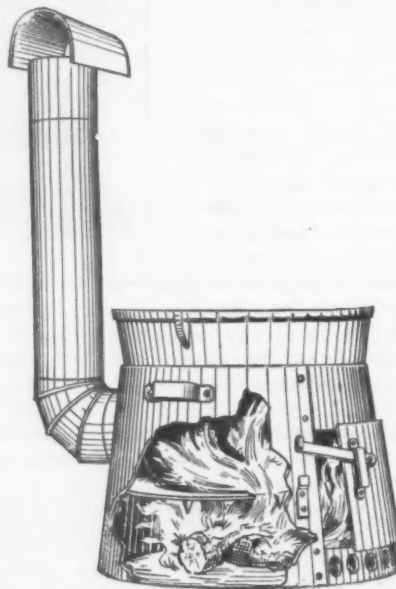
Clauss Corruqa Razor Strop.

The strop here shown is put on the market by the Clauss Shear Company, Fremont, Ohio. It is of double leather, and genuine horse hide is used for the finishing side, it being a honing and finishing strop combined. Reference is made to the ease with which a sharp edge is put on a dull razor, and to the finished velvet edge.

The corrugations in the strop are filled with a special preparation which is forced into the leather and corrugations. In addition to this, it is explained, when a razor is drawn over the strop it takes up the preparation, drawing it back and forth, the corrugations removing it each time from the edge of the blade, keeping the blade clean, yet at the same time serving the purpose of sharpening. It is pointed out that in this way an easy or smooth sharpening preparation can be used, instead of a gritty substance. The wearing qualities of the strop are also alluded to, as when the corrugations are worn down, it still has the merit of an ordinary strop. The strop can be conveniently carried in a grip or hung in a room ready for use at all times.

Ruhmann's Patent Portable Furnace.

G. E. Ruhmann, Schulenberg, Texas, is offering the portable furnace, designed for cooking food, rendering lard or for other purposes where cast iron or copper kettles are ordinarily used. The furnace is made of No.

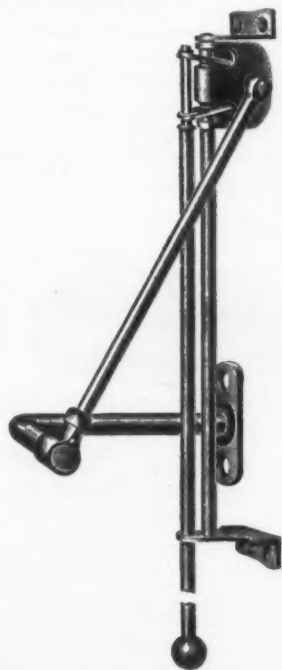


Ruhmann's Patent Portable Furnace.

12 gauge sheet steel, which, it is said, will not crack from heat. As it is intended for use on the ground, it has no bottom. The flue wing is adjustable and in operation is placed against the kettle to concentrate all the heat around it before passing through the smoke stack. The casing can be expanded $3\frac{1}{2}$ to $4\frac{1}{2}$ in., to accommodate various sizes of kettles. Among the advantages enumerated are the following: That the furnace prevents hazards incident to open fires, that it is economical with fuel, that water may be boiled in half the time with one-third the fuel required for an open fire, and that, being portable, it may be moved to any convenient place. The furnace is made in six sizes to fit kettles from Nos. 12 to 35.

The Payson Simplex Transom Lifter.

The transom lifter here shown is a new design patented and put on the market by the Payson Mfg. Company, Chicago, Ill. While retaining the lock principle



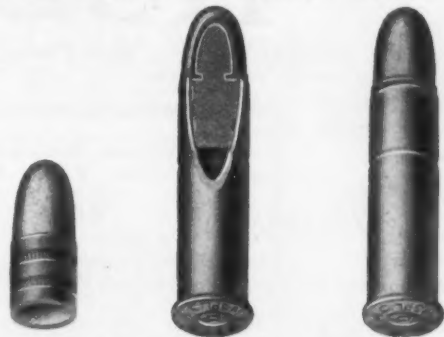
The Payson Simplex Transom Lifter, in Which the Operation of the Rod Automatically Opens and Closes the Grips.

characteristic of the solid grip lifter made by this company for many years, it embodies new features of convenience in operation and compactness in packing. Instead of the lock being operated by hand, the push and pull necessary to open and close the transom is effected through a rod which releases the lock and allows it to pass freely along the guide which it automatically grips when pressure is removed. This permits the sash to be operated by one hand, assuring at the same time security and firmness in locking. Another advantage noted is that the lock being nearer the transom has greater strength, and there is less marring of the trim, because fewer screws are used. Both lock and lifter are placed higher up and out of the way and less time is required for attaching it.

The 3-ft. and 4-ft. sizes of the lifter are packed in cardboard boxes, the $\frac{1}{4}$ -in. size one dozen in a box and the $\frac{3}{8}$ -in. size one-half dozen in a box. This feature is interesting to the hardware trade, as the method of packing well adapts these sizes for disposal upon store shelving and amply protects the finish. The lifter can be applied to transoms hung at the top or bottom, also to those side pivoted, opening at the top or bottom.

The U. M. C. Metal Point Revolver Cartridges.

The Union Metallic Cartridge Company, 313-315 Broadway, New York, has just put on the market the U. M. C. metal point revolver cartridges. The popularity of this principle embodied in a bullet for rifles has led to a demand for similar ammunition for revolvers, but the differences between the two arms has heretofore made it inexpedient. Full metal cased bullets while suitable for rifles, single shot and automatic pistols are not adaptable for revolvers because their covering is entirely hard metal and this offers great resistance on entering the rifled barrel. Such resistance causes an escape of gas and consequent loss of power and accuracy. The new metal



Bullet. Sectional Cartridge. Finished Cartridge.
The U. M. C. Metal Point Revolver Cartridges.

point bullet, however, as will be seen in the illustration, has a covering of metal over the point of the bullet only, or about one-half of its length, and a surface bearing of lead for the rest of it slightly greater in diameter, so that

the hard metal does not come in contact with the rifling, thereby retaining the good qualities of the regular lead bullet as far as the effect on the interior of the barrel is concerned. The advantages of the new bullet are accuracy, cleanliness and much greater penetrating power, as the metal point bullet will not mushroom on impact as does the ordinary lead bullet, thereby greatly increasing the penetrating power and covering almost the entire lead surface makes it a cleaner bullet to handle. At present the cartridge is made in .32 Smith & Wesson, regular and long; .38 Smith & Wesson, regular and special; .44 Smith & Wesson, Russian and special; .32 and .38 Colt new police and .38 Colt special, the list prices being \$1 advance over cartridges with ordinary lead bullets.

Clark's Safety Razor.

The Clark Blade & Razor Company, 56 Summer avenue, Newark, N. J., has just put on the market Clark's safety razor, which is made with two shaving edges, for regular or close shaving, no adjustment being required. Fig. 1 shows the razor as used, and Fig. 2 the four parts detached. The protecting combs on each side are so



Fig. 1.—Clark's Regular and Close Shave Safety Razor.

made that the correct angle must be determined before the edges will cut, thus preventing any tendency to scrape. The blades are made of a special razor steel, known as Clark's gray steel. As a result of the patented process used in making this steel the center between the two cutting edges is much softer than the edges, and as the blades are made from sheets .009 thick, they are double the thickness of some wafer blades, including the Gillette blade. This thicker gauge enables the manufacturers to hollow grind the edges and have a much longer bevel, more like the principle of the regular razor blade. The blade is $1\frac{1}{4}$ in. long, $\frac{7}{8}$ in. wide and will fit either the Clark or Gillette razor. The company calls

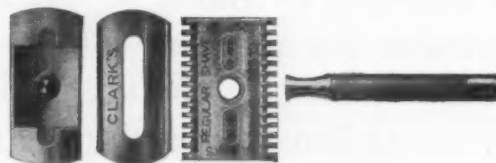


Fig. 2.—Parts of the Clark Safety Razor.

special attention to the quality of the blades and the fine edge on them as sent out. The razors are handsomely put up in metallic cases, $3\frac{3}{4} \times 1\frac{1}{4} \times \frac{5}{8}$ in., lined with purple silk plush, containing beside the razor frame a metal case for 12 blades, each with two cutting edges. The No. 200S style is triple silver plated, case and razor. No. 200 G. M. is a gun metal case, with triple silver plated razor, and No. 200 G. is gold plated for both case and razor. The cases are in two patterns, the Morning Glory style representing that flower in a border around the top, with plain center, and another is a smooth surface in satin finish. The outfit is put up first in a jeweler's flannelette bag and then in a double paste-board box and is sold at a restricted price.

The New Ideal Mortise Lock.

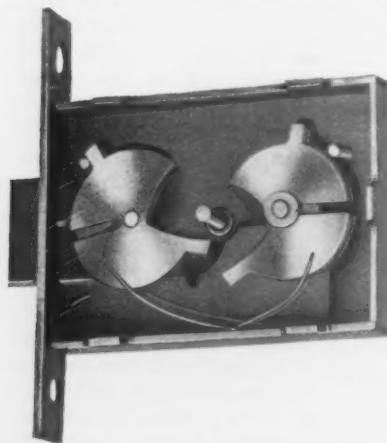
The interior view given herewith illustrates the new Ideal mortise lock, which the Philadelphia Hardware Company, 413 Cherry street, Philadelphia, Pa., has patented and placed on the market. It is double acting, has four tumblers, and is of simple construction, with

accurate working of the bolt and tumblers when the key bits are engaging them to the locked or unlocked position, while the position and shape of the tumblers are such that it is almost impossible to tamper with the inside mechanism of the lock. The lock is $1\frac{3}{4}$ in. long, 1 5-16 in. wide and $\frac{1}{4}$ in. deep, the thinnest mortise lock

the lock is being made chiefly of the mortise type, it will be made in additional styles in the near future.

Combination Circular India Oilstone.

The Pike Mfg. Company, Pike, N. H., is placing on the market a combination circular oilstone, as illustrated herewith. It consists of a circular India oilstone, coarse on one side and fine on the other, mounted in a circular hardwood box, with top and bottom covers. The construction of the box is such that the coarse stone is exposed by taking off one cover and the fine stone by turning the box over and removing the other cover. The



View of Interior of the New Ideal Mortise Lock of Double Acting Four-Tumbler Construction.

for actual service, it is claimed by the company, that has ever been produced with four tumblers. The number of tumblers, it is explained, permits also the making of a greater variety of keys than any other lock of similar size. The bodies of the lock, tumblers, bolts and keys are made of pressed steel, and the locks are made for either right, left or upright positions. A feature of the lock is the positive action of the bolt, which is always in direct connection with the tumblers. While at present



Combination Circular India Oilstone, Which, Unlike the Rectangular Oilstone, Will Not Hollow Out in the Center.

stone is 4 in. in diameter, the coarse side $\frac{1}{2}$ in. thick and the fine portion $\frac{3}{8}$ in. thick. It is said to have the advantage over the ordinary rectangular oilstone of not hollowing out in the center. It is particularly recommended for use by patternmakers and users of tools upon which the edges must be kept perfectly straight. It permits a broad, rotary sweep, which is the motion preferred by many mechanics in putting a fine cutting edge upon a tool. The box is of best quality hard wood, highly polished. The inside is lined with felt pads, which absorb surplus oil, keeping the stone moist, the grit alive and always ready for use.

Current Hardware Prices.

On account of Tuesday being a legal holiday, strictly observed by the Electrotypers' Union, it is impossible to electotype our Current Hardware Prices as usual, and they are accordingly omitted from this issue. Fortunately, this occurs in a week when there are few changes to make, so that last week's quotations in general still represent the market. Our readers are referred to our Notes on Prices, where any changes of importance are referred to. The regular quotations, revised up to date, will appear in our next issue.

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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